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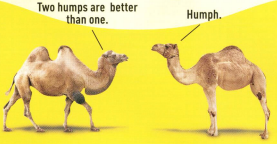
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40 SSD 2010 UPDATE

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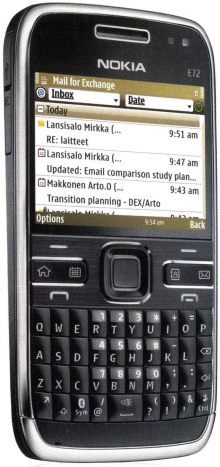
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06 editorial

TONY SARNO



BUT AS WITH ANY PROJECT, YOU SOON DISCOVER THERE ARE CHALLENGES YOU DIDN'T EXPECT

Having tried to understand the attraction of TV backyard makeovers, I figured that if people get excited about watching some pot plants being shifted around, they might be even more thrilled watching the makeover of a company's IT infrastructure. Alright, well, maybe just *APC* readers. When you revamp a business's IT you're dealing with complexities and human dramas that go way beyond those in a garden or house makeover. There's the fact that if you get the IT transformation wrong, you can severely damage bottom lines and careers. There's the challenge of identifying exactly the right solution when the products are complex and dozens of vendors claim theirs is the best. You also have to deal with the impact on employees and their roles, and try and bring the project in on time and to budget. In short, a major IT upgrade can be compelling drama, so we wanted to capture some of this for *APC*. Looking for something manageable, we discovered that Sydney community radio station FBi Radio 94.5FM had not yet upgraded its CD-based music library to a full digital system because this would involve purchasing expensive storage hardware. We figured we could help if FBi agreed to a public makeover. When they did, storage vendor Seagate came on board and the FBi makeover project was born (page 106). But as with any project, you soon discover there are challenges you didn't expect. Seagate and *APC* can help FBi upgrade the storage, but FBi also needs to come up with a system for tagging its music before storing it. Incredibly, given the millions of radio stations around the world, there aren't any off-the shelf solutions that suit the station's unique playlist. We'd like to hear from those readers who have approached the challenge of cataloguing and tagging data, particularly music. If you feel you can help, go to **apcmag.com/fbimakeover** (the online home for this project), and tell us your thoughts. We'll include you in the makeover coverage. ***tsarno@acpmagazines.com.au***

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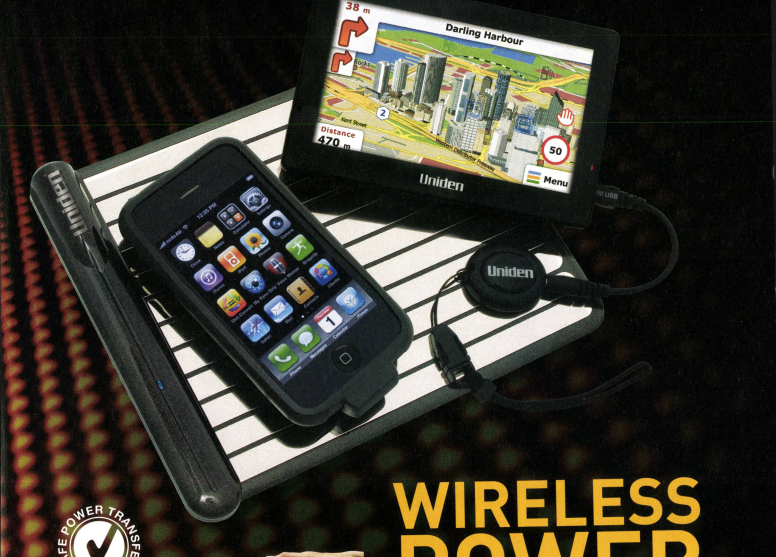
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PREVIEW



BEND IT LIKE BENDER
Why lug around a tablet and a phone when one device will suffice? If Dell ever releases it in Australia that is.

Dell's Android-powered Streak tablet

David Flynn asks if Dell's 5in smartphone/slate combo could replace both an iPhone and an iPad?

While smartphone vendors take on the iPhone – and netbook vendors prep their wanna-be 'iPad killers' – Dell has cannily staked out the made-for-mobile middle ground with its 5in Streak.

Being both a smartphone and a slate, Dell believes the Android-powered Streak will hit a sweet spot with customers who want the best of both devices in one go-anywhere package.

At the time of writing Dell Australia had not announced its plans for the Streak but allowed *APC* some hands-on time with the device.

The company has also toured the mini-tablet around local telcos, with an exclusive contract-based carrier deal tipped to be on the cards if the Streak lands here.

We tested the Streak on Next G, but the device also supports 2,100MHz and 900MHz – so it works on the dual-band networks of Optus and VHA.

The Streak looks more slate than smartphone, with the buttons on the front panel oriented towards use in landscape rather than an upright 'portrait' mode. The interface is also geared to widescreen orientation in order to maximise the real estate of the sharp 480 x 800 touchscreen display.

The only time you'd really be likely to hold the Streak vertically, like a phone, would be when you're using it as a phone – and even then you might be better off using it with a Bluetooth earpiece.

Not that the Streak is unusable, unwieldy or even uncomfortable as a mobile phone. It's just longer and wider than you're used to, and it *does* look odd to be holding this little black slab up against your ear.

While the Streak currently runs on Android 1.6, Dell plans to jump straight to Android 2.2 'Froyo' at launch (or through an over-the-air upgrade).

Dell has also added its own tablet-friendly skin codenamed Bender, after the robot in Futurama, although this is a more subtle interfacelift compared to the dramatic overhaul of HTC's Sense UI.

Bender allows up to six desktop screens, which it calls 'rooms'. Each can be loaded up with live widgets, app icons, shortcuts to folders and quick-action icons (such as calling a person in your contact book) plus individual wallpaper.

Tapping the arrow button at top-left of the ever-present menu strip shows a row of six pre-selected favourite apps; another tap reveals the full set of Android apps.

Another of Bender's best attributes is the on-screen keyboard, which has been extended to make best use of the 5in display by including a numeric keypad at the right side of the QWERTY keys.

The Streak is delightfully smooth when moving between each screen, as well as opening apps, thanks no doubt to the punchy 1GHz Snapdragon processor.

TOP 10 ...GOOGLE SEARCH TIPS

Google search has lots of rarely used, but powerful operators.

1 LINK: SITENAME
Find all links to your web site. Our apcmag.com had 204.

2 CACHE: SITE-URL
Old sites cached by Google with <search term> cache:site-url

3 ~ (tilde) ~
Use the ~ to look for a word and synonyms, like ~moon

4 THE | PIPE SYMBOL
Instead of OR, you can use the | symbol

5 + (PLUS)
Includes a common word, like "and" or "to," like +and

6 * (ASTERISK)
Wildcard that fills in blanks, like "The *are tall mountains"

7 FILETYPE:‹FILE EXTENSION›
Search for file types, .ie, <aircraft> filetype:png

8 SITE: ‹SITE URL›
Search a specific site, such as <ipad> site:acpmag.com

9 DEFINE: ‹WORD›
No need for dictionary.com. Just type <word> dictionary

10 MOVIE: ‹MOVIE NAME›
Quickly find reviews of a particular movie



SONIC BOOM
Gone are the days of washed out notebook audio. The ASUS N-series is bringing sound to the portable masses.

SWEET NOTEBOOK SOUND

Audio in notebooks is usually an afterthought, not a feature.

While today's high-end notebooks have the processing prowess and graphical grunt to shame most desktop PCs, even the best road warriors can't compete when it comes to audio fidelity. It's the nature of the slim-lined beast, with most manufacturers unwilling to integrate the larger sized speakers necessary for Hi-Fi sound, instead using tiny two-dollar speakers. ASUS looks set to buck this trend, with the launch of its SonicMaster brand, promising to deliver Hi-Fi quality sound starting with its N-series of notebooks, with no external speakers required.

SonicMaster is the offspring of ASUS's Golden Ear Team, a special skunk works team who worked in conjunction with Bang & Olufsen's ICEPower consultation group. The two teams focused on three primary areas to deliver a new standard in mobile audio.

The first issue to be solved was that of noise, commonly referred to as static. A new proprietary audio codec was created, and the demonstration unit we heard at a demo illustrated a total lack of any white noise. The next area of concern was notebook speaker volume, or lack thereof. By using a new 3W amplifier in conjunction with 25mm transducers, the overall volume of SonicMaster products is dramatically enhanced. While we didn't have a sound meter at the event, we can comfortably claim that the demo unit is at least twice the volume we're accustomed to. The third and final issue is that of weak bass. The solution is a set of 80cc speaker chambers, four times the size of today's average notebook speaker. However, only the high-end 18.4in NX90JQ notebook included this large speaker design, with the smaller notebooks in the N-series range lacking this feature.

During our hour of listening tests it was clear that ASUS has set the benchmark for audio quality. It's still not quite as clear or loud as a set of standalone speakers, but it's not far off. Stay tuned for our upcoming review of an N-series notebook.

CRAZY IPOD SPEAKERS

Serious style and excess is coming to iPod/iPhone speakers. **David Braue** highlights some of the style contenders.



PHILIPS DS9000 FIDELIO PREMIUM SPEAKER DOCK WITH REMOTE

Philips' latest offering is designed for high-fidelity sound, with a 6.49kg wood cabinet and two-way stereo speakers with isolated left and right chambers. There's a 3L woofer for big bass sound; ring-radiator tweeter; companion Fidelio app for extra features; proximity sensor that dims the sound controls when you're away from the unit; and spring-loaded docking mechanism that means you don't have to take your iPod or iPhone out of its protective case to play.



BOWERS & WILKINS ZEPPELIN

It looks like an alien ship, and doesn't come cheap – but Bowers & Wilkins Zeppelin oozes style and has been designed to sound a real treat. There's a pair of 25W midrange and a pair of 25W tweeters, backed by a 50W woofer and inputs including iPod/iPhone dock, mini TOSlink optical digital, and a USB 2.0 slave mode that lets the unit double as speakers for your computer. The Zeppelin also plugs into a TV via S-Video or Composite ports, allowing you to play movies from your iPod or iPhone with room-filling sound to go along with it.

KOGAN WI-FI DAB+ DELUXE DIGITAL INTERNET RADIO WITH IPHONE DOCK

Melbourne online retailer Kogan sells just about everything these days, so it's no surprise to hear it has a set of iPod speakers as well – and typical of Kogan products, features everything including the kitchen sink. Not only does this unit feature stereo speakers and a subwoofer for solid iPod/iPhone sound and an alarm to control it, but it has both DAB+ digital and FM analogue radio to bring you all kinds of audio programming. And, if that's not enough, it has built-in WiFi and LAN port to let you stream Internet radio and Real Audio, MP3 and WMA files straight off of your network. Think of it as your one-stop music shop and you won't be too far off.





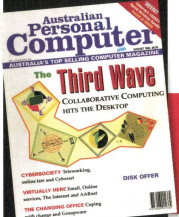
HARMON KARDON GO + PLAY MICRO

This smaller version of Harmon Kardon's Go + Play boom box is packed with drivers at all frequencies, with a pair of 15W tweeters and a 30W woofer along with five drivers. It works from a mains plug or on battery power, and can be easily carried with you if you're on the move. Also incorporates a video output so you can watch your iPod and iPhone photos and videos on TV.

VESTALIFE FIREFLY

One of the more interesting designs to hit the market in recent years, the Firefly's stereo speakers rotate like a ladybird's wings, providing an interesting look that also expands your stereo sound field. The unit features a built-in subwoofer, video-out jacks, and can run off AA batteries if you're on the road.

THE (A)PC REVOLUTION
AUG / 1994



SNEAK PEEK AT WINDOWS 4

After subjecting more than 300 people to hours of usability testing, Microsoft has settled on a new interface for the next version of Windows, code-named Chicago. Though Chicago is still Windows, it will look dramatically different. Conceding that Windows 3.1 and Windows for Workgroups 3.11 were too difficult for new users, Microsoft's goal for Chicago's user interface was to create an environment that would be easy to learn while still providing the power and speed for experienced users.

NEXGEN, PENTIUM THREATS

Until the second quarter, chip makers promising software compatible rivals to Intel's Pentium have been all talk. Now, three CPU hopefuls have taken serious steps forward, two of which have IBM manufacturing power behind them. NexGen unveiled its Nx586, and Cyrix's M1 process is expected by Christmas.



HOT PRODUCT

Kinect gets gamers off the couch, sends Wii packing

APC spent several hours with this gadget, and left with the feeling it's going to be the next big gaming thing.

APC has just returned from the Electronics Entertainment Expo (E3) 2010, the world's biggest excuse to play the hottest games and gaming tech, hosted annually in smoggy LA. While it was one of the biggest E3's we've ever seen, with major tech debuting from Sony, Nintendo and Microsoft, one device in particular dominated the headlines – the motion-sensing Kinect for Xbox 360.

While the Wii revolutionised gaming with the introduction of motion control, the Kinect (formerly known as Project Natal) takes this concept to the extreme, ditching the controller entirely. Instead of a small plastic wand your entire body, as well as your voice, becomes the controller. Housed in the elongated Kinect black box is the potent combination of an RGB camera and an IR camera, which combine to map skeletal motion across twenty different joints, while the multi-array microphone delivers voice control.

Remember the cool GUI made famous in Minority Report? This is now science fact, with Kinect allowing us to navigate through the Xbox 360 interface using sweeps of the hand and vocal commands. It's not quite as precise as Tom Cruise's amazing machine, but it's not far off. It can even be used to control video playback, making the remote control a thing of the past.

But it's the Kinect games where this gadget truly shines, and there are plenty of them. We witnessed over a dozen in action, and went hands off with half of them. The Wii's killer app was the immensely successful Wii Sports, and Microsoft is primed to replicate this success with Kinect Sports. Kids whose parents are allergic to cat fur will love Kinectimals, a sickeningly cute Tamagotchi-styled animal simulator, where baby big cats are trained by copying your off-screen antics. The most impressive piece of software from a technological point of view was Your Shape – Fitness Evolved, which serves as a personal trainer, covering a variety of sweat inducing exercises including Yoga and Boxercise.

While there was a small amount of latency between our body motions and that of the on-screen avatar, it wasn't enough to spoil the experience. The one-to-one motion mapping is slightly less accurate than the Wii when measuring a single point, but combine all twenty joints and it provides an excellent overall picture of what our bodies were doing.

The only thing that can stop Kinect being a massive success is its price, which is yet to be determined. With a late 2010 release, it won't be long before we know whether the rumoured US$150 price tag is accurate – either way, we're waiting for the inevitable "gamer puts hand through plate glass window while air boxing" stories that Nintendo became so familiar with after the Wii's launch.



CHARGE YOUR GADGETS WITHOUT PLUGGING IN

Wireless charging may have a fantastic history, but it's not pie in the sky. **David Braue** looks at your induction options.

In 1901, scientific wunderkind Nikola Tesla began constructing Wardenclyffe Tower, a facility intended to wirelessly transmit power between America and Europe. The tower was never completed and was dynamited by the US government in 1917, but its underlying principle – the use of electrodynamic induction to transfer electromagnetic energy without the need for wires – lived on. Its latest incarnation has delivered a range of mainstream devices that allow you to recharge your smartphone or portable gaming console without actually plugging them in.

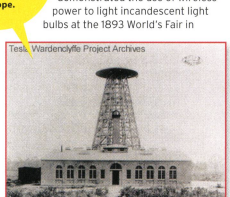
POWER THROUGH THE AIR

Induction's basic principle is relatively easy to understand. It grows out of André-Marie Ampere's discovery, nearly 200 years ago, that transmitting electricity down a wire creates a magnetic field around that wire. A decade later, Michael Faraday developed his fundamental law of induction – a process that enables the transfer of power from one wire to another using magnetic fields.

The phenomenon was later concretised in maths as one of Maxwell's equations, and is the basis for a broad range of everyday devices including electrical motors and electrical generators. All work according to the same basic principle: that if you have one electricity-carrying wire generating a magnetic field, then bring another wire into that magnetic field, the process works in reverse to induce electricity in the new wire.

Exploration of Faraday's theories led Tesla, a Serbian-born scientist who emigrated to the US in 1884 to work with Thomas Alva Edison and eventually invented AC power and motors, to explore the remote transfer of energy in such systems at a much larger scale. Tesla famously demonstrated the use of wireless power to light incandescent light bulbs at the 1893 World's Fair in Chicago, and conducted decades of research that included his failed attempt to reproduce the effect at much larger scale with the Wardenclyffe effort.

Nikola Tesla planned to use the Wardenclyffe Tower to wirelessly transmit power from New York to Europe.



David Bowie played Tesla in the corker 2006 film *The Prestige*, in which a magician calls on Tesla to help create an illusion like no other before. The technique is also used in basically any situation where batteries are being charged without physical metal contacts – for example, in recharging electric toothbrushes or wet/dry electrical shavers. RFID tags also work by induction, as do recently-popular induction cooktops that transfer energy directly to a pot's metal bottom but remain cool to the touch.

DROP YOUR PHONE, CHARGE AWAY

Induction also powers a new breed of charging mats that wirelessly transfer energy to your devices, allowing them to be recharged by simply placing them on top of a special mat. Inside that mat is one inductive coil, through which electricity is run and power transferred to a second coil attached to the device in question.

Future phones and other devices may well have induction coils built in, but for now you just plug one into your device, drop your device on the mat, and leave it there as



THE JUICE

1. **Powermat**
 www.powermat.com/pm_au/
 $199
2. **PureEnergy Wildcharge Pad**
 www.shoppureenergy.com
 US$79.99
3. **Uniden Wireless Power Pad**
 www.uniden.com.au
 $179.95
4. **Case-mate Hug**
 www.case-mate.com
 US$100
5. **Duracell myGrid**
 bit.ly/ayin99
 US$69.99
6. **Olin Wireless Charger**
 http://olinstyle.com/
 $129

Tesla's magic fills your battery. It's easy to do, but can also be quite annoying as offerings on the market today typically wrap their induction coil into an entire sleeve.

This means that, to charge your iPhone, you need to remove it from any case or sleeve you normally use, then slide it into the purpose-built charging sleeve. Once the device is charged, you have to reverse the process – unless, of course, you're happy to leave your phone in the inductive sleeve all the time. This may be just fine if you're happy with flat-black cases, but those of you that prefer a more blinged-up or functional case may find the constant re-sleeving annoying.

Another issue with current induction chargers is the lack of standardisation. Even if you keep your device in the charging sleeve all the time, there's no guarantee that it will work on a mat located elsewhere. This limits the ability of a restaurant, library, office lobby, or other public space to be home to charging mats available for general use.

THE POWER OF QI

Recognising that the industry's development would be held back by a lack of standards, a group of companies including National Semiconductor, Nokia, Olympus, Philips, Sanyo, Research In Motion, Duracell, Samsung, and more banded together in 2008 to create the Wireless Power Consortium (**www.wirelesspowerconsortium.com**).

Their work product, released last year, was a universal wireless power charging standard called Qi ("chi") that uses a stylised logo to indicate compatibility. They offer a presentation of how the technology works at **bit.ly/brirPf**, but the basic idea is to couple the induction process with a low-speed (2Kbit/s) communication format that lets Qi-compatible devices communicate with Qi-compatible charging mats to announce themselves, identify required power, stop charging when the battery is full, and so on.

Because induction works best when the transmitting and receiving coils are the same size and in alignment, the standard specifies several ways manufacturers can ensure the right matchup. Mats may use an array of overlapping coils so the device can be placed anywhere; guided positioning, which uses magnetic attraction to position the device directly over the induction coil; or free positioning, in which the induction coil can move to the best possible position.

With a standard to work against, manufacturers are finally moving to release real product for household use that could soon see inductive pads installed in all sorts of public spaces. Broader availability of induction chargers should drive changes in the devices being used: there's no reason devices couldn't be built with induction loops built into their bodies, allowing them to recharge their batteries whenever you run across a compatible charger. They could even be recharged without taking them out of your pocket, if companies set up special hot zones where an inductive terminal was ready and able to zap energy through the air.

All this is future speculation, but the general-use charging pad is reality now. A wealth of options has startups like AirVolt and Olin facing off against well-known brands like Duracell and Uniden. Some charge up to four devices at once, while more-cramped rivals charge just one. Every model spruiks its iPhone/iPod touch compatibility, typically offering iPhone-compatible charging sleeves that are a real pain if you already keep your iPhone in a protective case and have to swap with every charge. Most vendors offer optional adapters to charge your smartphone, mobile, Nintendo DS, and other USB-charging devices.

They're not cheap, but charging pads suit both gadgetphiles and small businesses where there's real time savings in just being able to drop your phone on the pad when you walk in the door. If you've ever struggled to find your actual charger, wireless charging mats may be exactly what you need.



HANDS ON WITH THE IPHONE4

Apple's new iPhone introduces the highest-resolution display of any phone as well as video calling and multi-tasking. But that's not all. **Jenneth Orantia** lists the top 10 new features.

1 NEW DESIGN

If you were disappointed by the similarity between the 3G and 3GS designs, you will be pleased to know that *everyone* will know you have an iPhone 4. The edges aren't as curvy as the 3GS, but it's 24 per cent slimmer at 9.3mm, making it the thinnest smartphone in the world (although we'll see how long that claim lasts). Having witnessed the tragedy of a smashed iPhone screen on more than one occasion, we're glad that Apple has made the screen tougher on the iPhone 4, using chemically-strengthened aluminosilicate glass that's 30 times harder than plastic. On the white iPhone 4, the colour now extends to the bezel around the screen as well.

2 FASTER PERFORMANCE

The iPhone 3GS was no slouch in the performance department thanks to a speedy 600MHz Cortex A8 processor, but the iPhone 4 kicks it up a notch with the 1GHz A4 processor – the same chip that's used in the iPad. This provides the necessary horsepower for new features like multi-tasking, recording and editing HD video and FaceTime video calling, as well as making it that little bit faster for opening apps, rendering web pages, browsing through photos – and even something as mundane as returning to the home screen. The reduction in size of the CPU from the 65nm Cortex chip to the 45nm A4 chip has also helped to slim the iPhone 4 down.

3 IMPROVED WIRELESS

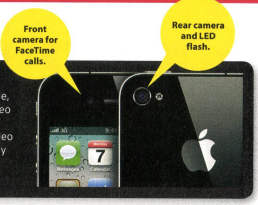
Apple has beefed up the iPhone 4's wireless capabilities with quad-band 850/900/1,900/2,100MHz HSPA coverage and 802.11n Wi-Fi. The former is handy if you live outside the metro areas of each state, as you can now choose between Telstra's 850MHz network or the 900MHz regional coverage of other carriers (previously the choice Telstra only, as the iPhone 3GS didn't support the 900MHz band). Support for the faster 802.11n wireless networking standard allows for a smooth video stream with the FaceTime video calling feature, and it also means you can download movies, TV shows and apps up to 70 times faster than 802.11g (although this is dependent on having an 802.11n router as well).

4 BETTER EMAIL CLIENT

Apple still has a way to go before it matches the email capabilities of platforms like BlackBerry and Android, but iOS 4 has made some improvements to the Mail client that makes it more efficient for serious email use. The unified inbox combines all of your email accounts into a single view so you can quickly check new messages in one place, and email conversations are threaded so you can now see all related messages together. Support for multiple Exchange accounts is another useful addition, especially since the only way to get push email from Gmail is by adding it as an Exchange service.

5 FACETIME

Video calling on mobiles has been available for the better part of the last decade, so we're going to take Apple's claim that people have been 'dreaming about video calling for decades' with a grain of salt. Features like the seamless transition between voice calling and video calling and the ability to use the front or back camera for the video feed makes FaceTime look like fun, but given that you can only use it over Wi-Fi (and only with other iPhone 4 users), it seems like more of a novelty to break out for special occasions than something that will get regular usage.

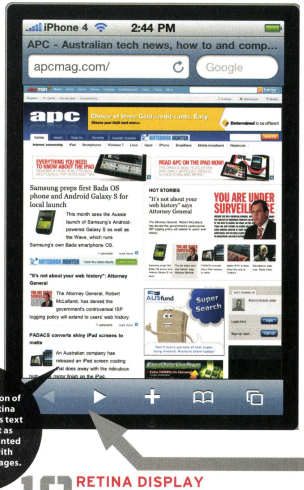


6 THE BATTERY

If there were just one feature of the iPhone 3GS that we could improve in the iPhone 4, it would undoubtedly be better battery life. Alas, battery life and new features always seem to play a cat-and-mouse game with every mobile device release, and while the iPhone 4 does have a bigger battery that's boosted by the superior power efficiency of the A4 processor, it's also got a significantly higher-resolution screen and new power-sucking features like multi-tasking and FaceTime. Battery life improvements therefore run to a modest two extra hours of talk time (seven hours), an extra hour of 3G browsing and Wi-Fi browsing (six and 10 hours respectively) and an extra 10 hours of audio playback (40 hours).

7 IMPROVED CAMERA

Apple has finally caught up to the rest of the smartphone world by equipping the iPhone 4 with a five-megapixel camera, LED flash and a secondary front-facing VGA camera for self portraits and video calling (see above). The iPhone 4 also goes one better with 720p HD video recording – one of only a handful of smartphones that currently offer this feature. The optional US$4.99 iMovie app (a condensed version of the desktop iMovie software) lets you edit your video clips with background music, transitions, themes and other effects, and you can upload videos directly to YouTube or send it via MMS, email or to MobileMe.



8 APP FOLDERS

iPhone OS 3.1 introduced the ability to customise home screens through iTunes 9, letting you organise your apps more efficiently on each screen – a big improvement over the previous method of dragging a single icon through the home screens manually. iOS 4 takes this further by letting you group apps into folders. The folder is automatically named by the category of the apps you're grouping together (although you can rename this to anything you like), and you can fit up to 12 apps into each folder. This brings the total apps that you can house on the home screen to a whopping 2,160.

9 MULTI-TASKING

Yes, you can finally run apps in the background. No, it doesn't work for every application. Apple has limited the apps that can fully run in the background to audio, navigation and VoIP, mainly to prevent background apps hogging system resources and battery life – a common problem for true multi-tasking platforms like Windows Mobile 6.5 and Android. For other apps, iOS 4 (the new name for Apple's mobile operating system) 'pauses' them so you can relaunch them in the same state, facilitated by a dock – which appears when you double-click the Home button – that displays all of the open apps.

10 RETINA DISPLAY

While it shares the same 3.5in footprint and capacitive multi-touch technology as the 3GS's screen, those are the only similarities. The iPhone 4 boasts Apple's new 'Retina Display', which packs in four times as many pixels for a resolution of 960 x 640 – almost as high as the iPad's 1,024 x 768 resolution. The pixel density of 326 pixels per inch makes individual pixels (which measure a tiny 78 micrometres each) virtually indistinguishable, so text looks almost as smooth as the printed page and images are sharp enough to cut your fingers on. Speaking of the iPad, the iPhone 4 adopts the same IPS (in-plane switching) technology for ultra-wide viewing angles, as well as having four times the contrast ratio of its predecessor (800:1) and LED backlighting.

16 epinions
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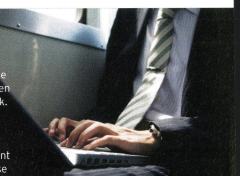
Notebook innovation

Widescreen monitors are great for watching movies and working with spreadsheets, but I find these widescreens come at a price when using apps that work better in portrait mode: most of the widescreen remains empty.

Here's a suggestion to any computer manufacturer who is looking for the next big innovation in notebooks. Rotatable screens! There are desktop computers with rotating displays and even the new Apple iPad looks great for reading documents and web pages when held in the portrait position. Why doesn't someone invent a notebook with a single hinge LCD mounted in the centre rear of the display? If you want to watch a movie or run a spreadsheet, just open and use your notebook normally. If you want to work on a text document or browse the net, open and rotate the screen to get that standard page look. Even Microsoft Word's new toolbar menus are not a hindrance anymore.

I think I'll run out and patent the idea before common sense returns to the computer manufacturing industry!

Nick Marentes
Holland Park West, QLD



FLIP IT
According to this reader, not everything works best in widescreen.

This month our readers have a varied selection of topics they'd like to share.

NBN PRICING

I am somewhat bemused by the pricing so far proposed by ISPs for NBN internet plans. iiNet recently announced packages starting at $49.95 a month for a 25Mbit connection with 10GB download. I really don't think such pricing is going to spark the information boom that has been touted by proponents of the scheme. I would expect significantly more generous plans to use the infrastructure that myself and all other taxpaying Australians have paid for.

Michael Jaschenko
Howrah, Tas

LINUX FAIL

I've always enjoyed Ashton Mills's articles on Linux, and I've read his latest on Ubuntu 10.04, but I am sad to say that, for me, Ubuntu – or rather Kubuntu, the KDE version – has lost its charm.

I've used Kubuntu for a couple of years and although I'm no Linux expert, I found it easy and hassle-free. For me, it was even more amazing that this OS was completely free to use. I much preferred it over Windows XP, which I was using at the time.

A new computer and Windows 7 later, all went well until I installed Lucid Lynx in a dual-boot setup. The first disaster was that Lucid wiped out the Ethernet driver, so I had no network/internet access on either Kubuntu or Windows! Fortunately, the ASUS site has downloadable Windows drivers for my motherboard and I could get it up and running again. Then the mouse and keyboard started to mysteriously freeze. It is still doing that under Kubuntu, and I have since found that my PC is not the only one. The Ubuntu forums are full of reports on the same problem, and nobody seems to have the solution.

Once an operating system starts having problems with the basics, such as getting a simple PS2 mouse or keyboard to work, I have serious doubts about it. It's a pity it has come to this, but I just can't trust Kubuntu anymore.

Emil Kolbe

TABLETS

I would just like to mention how impressed I am by Apple's tablet (the iPad). I pre-ordered the product on the third day and wondered what I would think of it. Having used it for nearly a month now, I really see what Apple was trying to do. The device is incredibly simple as well as fast and powerful. I love how the accelerometer works in any direction (even upside down) and the speed of the Apple A4 processor is great. I think it's probably best for media and web browsing, as the Safari browser on it is fantastic, while the video features and games are impressive. I recommend the iPad to all who love portability.

apc



STREAMING POWER

The latest streaming video and audio technology is amazing and the advancements made in the arena are phenonmenal. What frustrates me is not enough discussion is entered into the power consumption involved in playing videos on a PC. Why not use a product like the WD TV media player and transfer the video and audio to a hard drive instead of streaming. That way you can switch off your computer, save some money with reduced power bills and help the environment.

Ross Donnan
Kilda East, Vic

I get sick of people who have not used it calling it an over-sized iPod touch. The apps are specially built for it, it's more powerful and better!

Tim Gardner
Bundoora, Victoria

GOOD NEWS DELL

Back in September of 2007 I was one of the many thousands of people worldwide who purchased not one, but two Dell XPS m1730 notebooks at a cost of $3,000 each, specifically for my two daughters. So began my journey of frustration, eventually leading to utter despair due to the incredible amount of hardware failures I encountered with both machines. Most problems centred around the motherboard and graphics cards, but the biggest culprit of all was the 230W AC Adapter, of which I have had so many replaced that I have lost count.

I have also had multiple motherboards and graphics cards replaced in both units, in fact, apart from the HDD and optical drives, virtually everything else has been replaced more than once. Over these past 2 years I have pleaded with Dell on numerous occasions to simply replace them but my pleas were ignored.

I had to buy another year's extended warranty due to the unreliability of these machines of which I have 3 months remaining. About five weeks ago another AC Adapter stopped working properly, it still powers the notebook but doesn't charge it and it's not recognised by the notebook due to the very flimsy signal wire breaking which is a major flaw with these adapters.

I contacted Dell tech support via the online support service and once again told them of the incredible number of problems I'd had since I got them.

Dell said they would send a tech "out one last time" to check them and if need be, put in a request for full replacements. I replied that this is exactly what had happened on so many other occasions and asked if they could simply be replaced.

To my astonishment, I got a reply telling me that they would be replacing them with new Alien Ware m17x notebooks which have the very latest Core i7 CPU's, 6GB of DDR3 1333MHz RAM and a 1GB Radeon 5870 graphics card as the basic configuration.

I would like to give a special thank you to Andrew at Dell for listening, and then taking the action required that has resulted in such a fantastic outcome, so kudos to both Andrew in the tech support centre and to Dell for doing what I consider is the right thing by myself and my daughters.

Craig Bennett
Wantirna South, Melbourne

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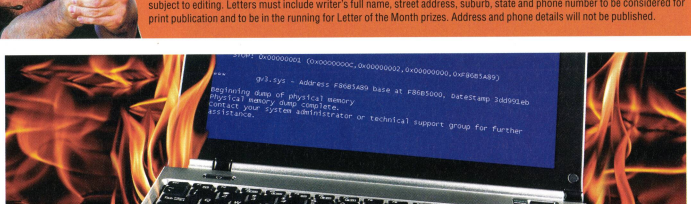
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Imported talent faces sticker shock

With several countries proving to be excellent sources of IT personnel, many Australian companies make use of the talent when it's available locally to bolster their IT backrooms. But sometimes, it doesn't always go to plan, as this story from *APC* reader Ross Smith* proves.

Smith was an onsite engineer for a small IT services provider when his company decided to hire another engineer. There were many talented candidates, Smith recalls, but the "directors of this company thought with their wallets first," and chose one based on the fact that he was willing to accept a lower wage.

Smith says the new hire was new to Australia and was virtually impossible to understand, but his CV showed that he'd been a security engineer of the highest order in his native country. "The minute we got him, he hit the ground running. And running very fast. Unfortunately, it didn't last long and after a number of onsite incidents, with customers complaining, the new guy getting lost despite having a GPS, and multiple stuff ups, it was decided to keep this gentleman in the back office instead of onsite."

Smith says that another look at the new hire's resume showed that he had worked in a computer store and that assembling computers from scratch was second nature for him. So, it was decided to hand him the tools to build his first PC.

"Now this company I worked for warranted each component in each build, thus requiring a sticker on everything. The RAM, case, hard drives, etc. Moments after being given the green light to commence building the PC, the new guy produced a remarkable specimen. All wires cable tied, internal cables hidden, everything was labelled and perfect! Windows XP was loaded and it was off to site."

A few days later Smith got calls from the office which had received the new PC. "They were having problems. Blue screens, lock ups, slowness, everything. Totally random they said. And as with most call outs, it rarely happened when we got there. A few days after that, the calls became ever more abusive and so I took the PC back for further analysis with a different colleague. After a couple of hours things started happening. The blue screens, lockups, slowness, everything." Smith did a RAM test, and it was fine. So was a hard drive test. But when it came to the CPU, he did a doubletake. The temperatures were soaring.

To find the cause, he opened the side of the case, revealing the perfect interior. The CPU fan was spinning, seemingly mounted correctly and not a spec of dust in sight. After what seemed like an eternity to cut all the relevant cable ties and free all the wiring, Smith and his colleague finally managed to remove the motherboard. A quick inspection revealed no identifiable motherboard problems.

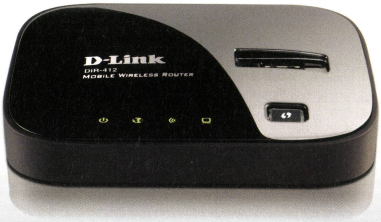
"My money was on an incorrectly installed CPU fan or not enough thermal paste. The answer was neither. The CPU fan was properly installed and there was the correct amount of paste. We scratched our heads. I wiped the thermal paste off the CPU and we proceeded to laugh our asses off! The new guy had placed the warranty sticker on the CPU instead of the CPU fan and applied thermal paste over the top!"

Smith says it was the last job the new hire got to perform for the company.

** Smith is an assumed name, as our reader does not want his real identity revealed.* EOTD

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Facebook scamming

Everybody trusts their friends — which is why social networking sites are now the target of scammers. Suddenly your friends might not be your friend.

Social networking provides rich hunting grounds for online criminals simply because of the inherent trust that we place in our friends. You might not fall for a scam presented to you directly via a phishing email or other source, but if information comes from someone you know, you'll be more likely to trust it. The problem is, your friends might not be as informed as you.

BE WARY OF APPS

In the race for revenue, many social-networking sites allow users to install web apps and to pass the time playing embedded games. However, the proliferation of apps is such that it's difficult to keep up with new ones, even for the site's dedicated security staff.

Because of this, there's a real danger that you could accidentally install malware. Without proper antivirus protection, you could then see your Facebook or MySpace account hijacked and used to send spam and malware, or your credit card details being sold and abused.

This might sound tedious, but search for any app that you want to install to see if it's been reported as dodgy — and ensure you're running decent antivirus software too.

THE FRIEND IN TROUBLE

A growing problem for social networking sites with chat facilities is the 'friend in trouble' scam. After hijacking an account, the con man starts a chat with somebody. He exchanges hellos and then says he has a problem. He's on holiday in a dodgy part of the world and, unsurprisingly, has been robbed.

Can you help him out by wiring him the money he needs to get home? Why wouldn't you want to help out a friend you know in real life? That's the central mechanism that makes this con work. Your job is to try to decide whether you're about to ignore a real plea for help. The easiest way of telling if the person is really your friend is to ask several questions only the real friend would know the answer to.

Remember that the scammer has access to the information in your profile, the profile of the account he's hijacked and those of your mutual friends. Because of this, be sure to ask about unique events that may have happened decades ago, and which neither of you has spoken about for years.

It's surprising just how quickly a scammer will make his excuses and leave, whereupon you must contact the account's real owner and tell him what happened.

"IS THIS YOU?"

This scam hints at the power inherent in the trust people put in their friends online. Earlier this year, Twitter users began to receive direct messages, discretely warning them that they should delete a photo they'd uploaded to another site. These messages were from a friend's account that had been hacked, and the victims had no knowledge of the other site and had never uploaded such a photo, but deliberately vague wording worried many people into clicking on the link and becoming infected with malware on the landing page.

HOW MUCH IS YOUR IDENTITY WORTH?

The rise of the web has seen identities become tradable commodities. To calculate what your identity might be sold for, Symantec has launched its Every Click Matters web site (**www.bit.ly/d3Fx5f**). Answer a few questions about your online habits to see what risk you're running of identity theft, how much you could see siphoned from your savings, and how much your identity itself is worth.

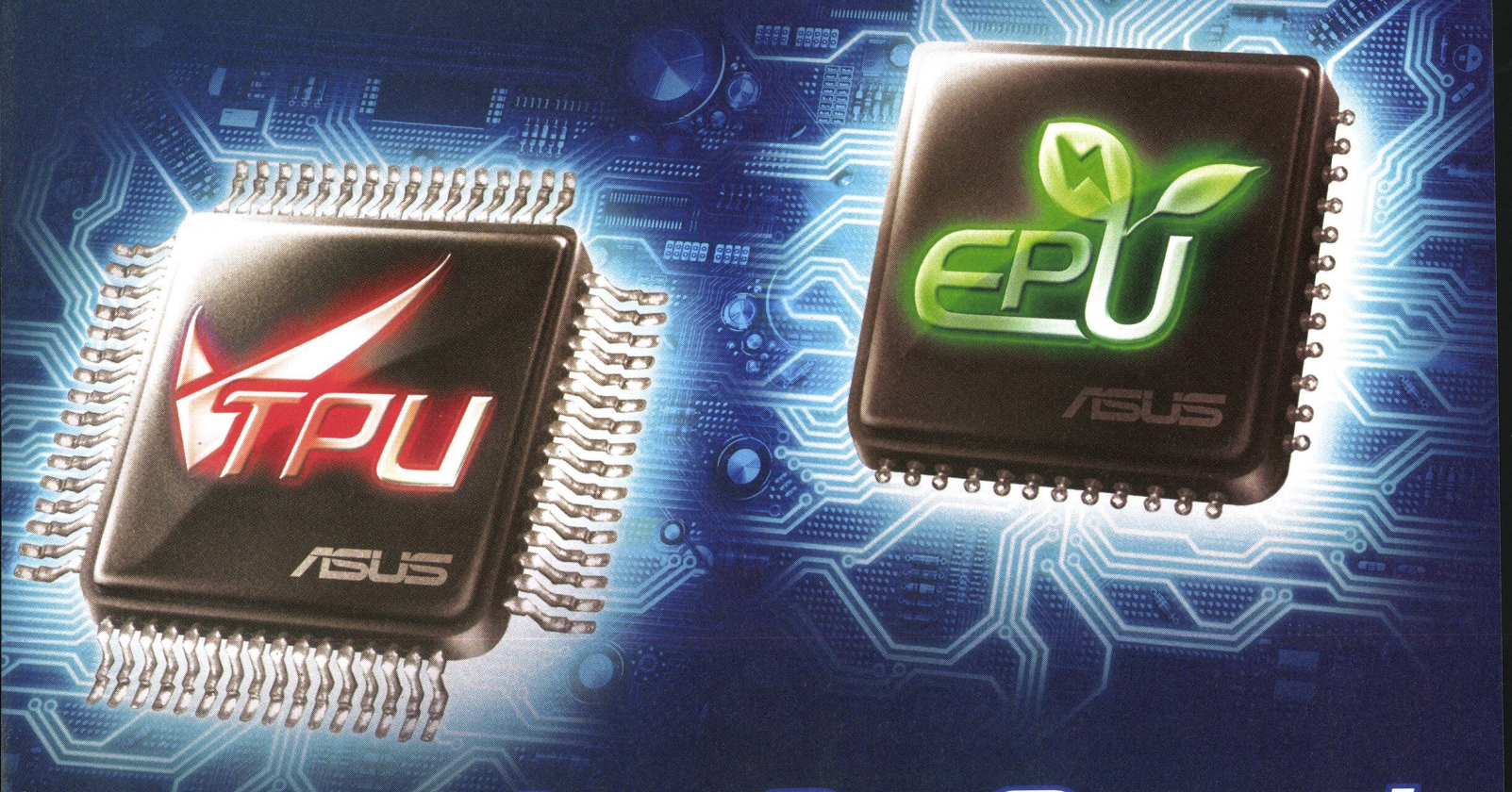
What's amazing is how cheaply your identity can be bought and sold. Because so many identities are stolen every year, their price has plummeted and they're now traded in bulk. The average cost of an exploitable identity is now just $10, which means such affordable access to your bank account and credit cards means that online fraud will always be recession-proof.



HOW MUCH IS IT WORTH? Unless you're a Super Hero you only have one identity — so guard it with your life.

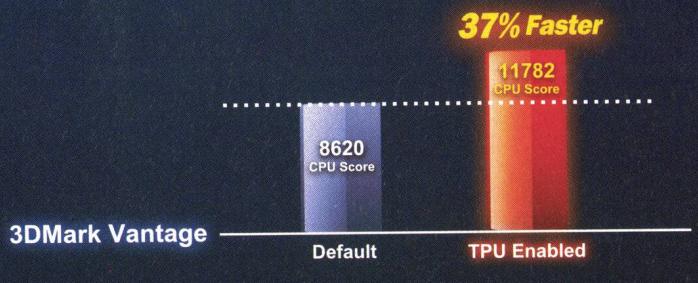
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Dual Intelligent Processors

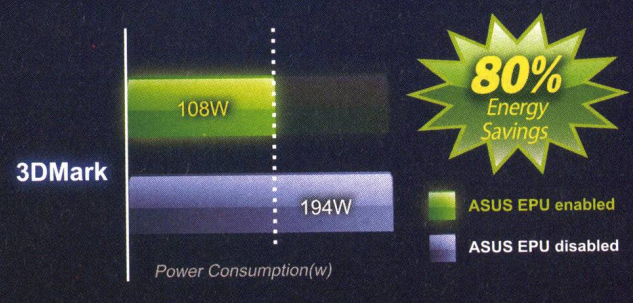
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Testing configuration: P7P55D Deluxe + Corei3-530 (2.9GHz)

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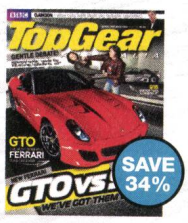
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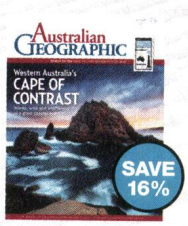
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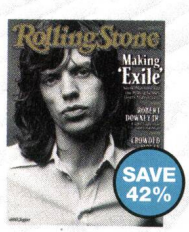
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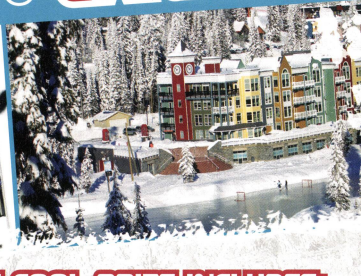
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NICK RACE
TECHNICAL EDITOR
NICK'S PICK

FLIP MINOHD

Don't get this new Flip MinoHD confused with last year's model. It's come a long way! Pocket HD camcorders are never going to get you that Oscar for cinematography, but for price and ease of use, they can offer a lot of fun value. This model shoots two hours of content, has one button and does exactly what it says on the box.

PERFORMANCE ★★★★

Saving 30 frames per second in H.264 high definition is no mean feat, especially for a device that fits in your pocket and runs off a battery. The MinoHD does quite well, and a two second start-up time can't be beaten.

PRICE ★★★★★

An HD camcorder for less than $300? Sure! The Flip Mino HD is more toy than tool, but for Facebook shenanigans or taking to the pub or park, it does just fine.

SETUP ★★★★

With the composite connector being replaced by a modern HDMI plug, a comfortably uncluttered screen and simple, simple, simple controls, there's little to complain about with this pocket rocket.



LABS ROUNDUP

SSD 2010 UPDATE

Solid State Drive technology is no flash in the pan — it's the future of storage and is getting better year on year.

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6/10

Alienware M11x

Proof that you can't judge a book by its cover.

Alienware
www.alienware.com.au
$1,299

Looks gorgeous; customisable light show.

Below-average hardware.

SPECIAL FEATURES
320GB 7,200rpm hard drive
HDMI and DisplayPort out
No optical drive

Make no mistake – this notebook's striking looks are targeted squarely at the gaming crowd with a fetish for neon. From the bright Alienware logo glowing beneath the screen to the beautifully backlit keyboard to the twin pulsing light panels on the front edge, this glowing beacon of tech looks like no other notebook we've seen. The envy of a rave lighting engineer, each light can be adjusted to any colour of the rainbow, and then set to pulse, flash or constant. We think it's gorgeous, with a distinctively masculine look.

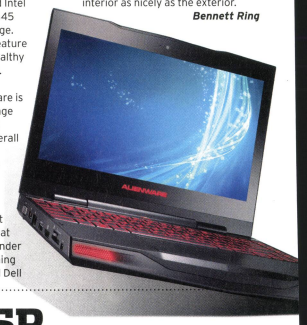
Despite its dainty dimensions – 28 x 231 x 30mm – this is a surprisingly heavy critter, weighing in at 2kg. We're not sure why it's so heavy, but we are sure of one thing – the hardware within is nowhere near as impressive as its good looks.

An Intel Core 2 Duo scrapes by at a meagre 1.3GHz, nowhere near the performance of the fantastic i5 430M chip that is so popular in cheaper notebooks. The NVIDIA GeForce GT 335M is similarly lacklustre, although it's interesting to note that it can be disabled to preserve battery life, falling back on the integrated Intel GPU. Even the Intel GS45 chipset is below average. The only redeeming feature under the hood is a healthy 4GB of DDR3 memory.

The result of this below-average hardware is obviously below-average performance. PCMark Vantage posted an overall result of just 3,500, almost half that of the ASUS G60J gaming notebook. Even more telling is the PCMark Vantage gaming result – at 2,820 it proves that this notebook is just under half as capable in gaming duties as the Acer and Dell notebooks also reviewed this issue.

We're left with the disappointing conclusion that this is a tragic case of style over substance. Hopefully next time Alienware will kit out the interior as nicely as the exterior.

Bennett Ring



8/10

Dell Inspiron 15R

Slick, sexy, and — most importantly — fast.

Dell
www.dell.com.au
$1,049

Great looks; even better performance.

Too heavy for frequent mobile use.

SPECIAL FEATURES
6-cell battery (9-cell optional)
1.3MP integrated webcam
802.11g/n
Intel HM57 chipset

APC MAGAZINE RECOMMENDED

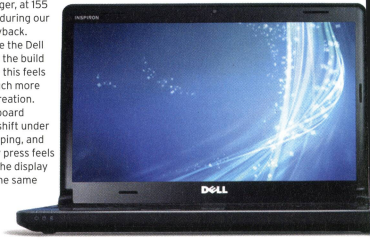
The new Inspiron impresses with its simple yet sexy design. Forget tacky motifs and dodgy paint jobs – the plain bright metallic colouring is hard to miss. Open it up and the metallic look extends to the interior, but this time it's a gun-metal finish. Despite the entire case being plastic, the metallic effect looks great.

Delving under the hood we see that the Inspiron 15R shares many similarities with the Acer Aspire 5741G also reviewed in this issue. The same Intel i5-430m CPU delivers excellent performance while multitasking, posting a very impressive PCMark Vantage score of 5,211. It's no wonder this chip is now showing up in every notebook under the sun. It's also got a very similar memory configuration as the Acer – four gigs of DDR3 1,066MHz, delivering excellent Windows 7 Premium performance. Yep, that's the same OS as the Acer. Even the hard drive was almost identical, at just under 500GB and 5,400rpm. Did we mention the 15.6in 1,366 x 768 display powered by the ATI Mobility Radeon HD 5470? Once again we could be reading the spec sheet of the Acer notebook. Disappointingly, like the Acer, this display also exhibited muted colours – very surprising considering it's an LED LCD. Battery life was also a dead-ringer, at 155 minutes during our DVD playback.

Where the Dell differs is the build quality – this feels like a much more sturdy creation. The keyboard doesn't shift under heavy typing, and each key press feels firmer. The display shares the same amount of flex as the Acer, due to a mainly plastic exoskeleton.

They've even got a nearly identical price – at $1,049 the Dell is ever so slightly cheaper. Considering the Dell has arguably better aesthetics, and definitely feels like the more substantial of the two, we know which one would get our hard-earned dollars.

Bennett Ring



6/10

Activo AP-2000

Is it time to take a punt on a bargain netbook?

Altech
www.altech.com.au
$599

Strong battery life; decent features; Win 7.

Smallish keyboard; poor trackpad; no HD video.

SPECIAL FEATURES
Large high-res screen
Cheap spare batteries available

The Activo AP-2000 is larger than your average netbook at 12.1in. Don't let the extra size fool you though, as the piano-black shell hides bog-standard hardware. While it can't compete with similar-sized units running Intel ULV processors, the AP-2000 is all about useability for bottom dollar.

Processing grunt comes from the capable Intel Atom 1.6GHz N80 CPU. You also get 2GB of DDR2 and a 250GB HDD. The Activo ships with a stripped-down version of Windows 7 Starter. On the plus side the AP-2000 happily handles everyday tasks like playing music, surfing the net, office docs or sending emails.

The 12.1in 1,280 x 800 screen is reasonably bright and clear, though the viewing angles could be better. Graphics capability is provided by the integrated Intel chipset, so anything but very old games are out of the question. Video playback is acceptable, though the Activo struggles with HD content. Decent sound from the onboard speakers is more than enough to play a movie in a quiet room. The AP-2000 also has three USB ports, Wi-Fi, Bluetooth, an SD card reader, 3.5mm audio I/O and a webcam. A VGA port is provided for connecting to an external monitor or projector.

Despite the large form factor, the keyboard on the Activo is standard netbook size and not ideal for extended bouts of typing. The touchpad is also fairly underwhelming though useable. The efficient Atom CPU keeps the Activo running cool while also facilitating decent battery life. In our tests we managed a touch over four hours of video playback or 5.5 hours of general use.

Ultimately the Activo AP-2000 is first-generation netbook hardware slotted into a larger shell. It doesn't do anything particularly badly but nor does it stand out. On the plus side it's nice and cheap – shop around online and you can find it for under $500.

Lindsay Handmer



8/10

Acer Aspire 5741G

Don't let this greyhound's price fool you.

Acer
www.acer.com.au
$1,199

Excellent performance; very affordable.

Poor image quality; slightly flimsy.

SPECIAL FEATURES
Windows 7 Home Premium
8x DVD-Super DVD drive
Intel HM55 Express chipset
ATI Mobility Radeon HD 5470

We're mature enough to admit that this notebook initially confused the heck out of us. Priced in the upper end of the budget spectrum, we expected middle-of-the-road performance. So when PCMark Vantage posted a score higher than high-end notebooks we've seen, we were left stroking our beards in an attempt to look like we understood what the hell was going on.

With an overall PCMark score of 5,361, the 5741G humbled machines that were selling for twice its price a mere six months ago. Delving into its innards we discovered why – there's a powerful Intel i5-430M processor. This icy cool chip churns through applications at a healthy 2.533GHz when under load, using two hyperthreaded cores. When paired with a respectable 4GB of DDR3 memory clocked at 1,066MHz, it cuts through multitasked applications like a laser through jelly.

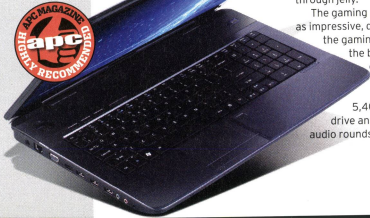
The gaming score wasn't quite as impressive, delivering 3,925 in the gaming subsection of the benchmark, but it's enough to run most of today's games at moderate settings. A 5,400rpm 500GB hard drive and Realtek integrated audio rounds out the silicon smorgasbord. The six-cell battery served up 161 minutes of DVD playback during our test.

Unfortunately, the externals don't quite match the wonderful interior. Most disappointing is the 15.6in 1,355 x 768 display – considering it's an LED LCD, the image is underwhelming and bland, with dull colour reproduction and a visible pixel structure. It's perfectly adequate for Excel spreadsheets, but your games and movies won't be as punchy as you'd like.

The keyboard is also a little flimsy, with noticeable flex – a characteristic shared by the display.

Still, those performance figures are hard to ignore at such an affordable price point. If you're looking for a basic work machine with plenty of oomph, without the frills, the 5741G fits the (very affordable) bill.

Bennett Ring



8/10

Scorptec Stinger

Now with more transistors than there are people on earth.

Scorpion Technology
www.scorptec.com.au
$5,499

Insane performance; professionally overclocked; water cooled.

Price equivalent to a new car; huge case; massive power bill.

SPECIAL FEATURES
RAID 0 SSD setup
Latest six-core CPU
USB 3.0 on motherboard

APC MAGAZINE AUSTRALIA RECOMMENDED

Building and overclocking a high-end gaming machine is a tricky business, so sometimes the best bet is to let the professionals do it. The guys at Scorptec have rocketed the performance of the Stinger way beyond any PC we've ever tested. The Intel Core i7 980X blasts along at 4.123GHz – the only thing stopping it bursting into flames is a Corsair H50 water cooler.

It packs two GTX480s from NVIDIA running in SLI. This monster processing setup is slotted into an ASUS P6X58D motherboard and backed up by 6GB of super low latency 1,600MHz DDR3. Windows 7 Pro 64-bit is installed on dual 64GB SSDs in RAID 0 with a 1TB HDD and a Blu-ray drive for extra storage needs. All this hardware is housed neatly inside a Corsair Obsidian 800D. Despite the five extra fans installed, the Stinger is still a very quiet gaming machine.

Not surprisingly, it aced all our tests. This beast of a machine manages a sky-high P32,374 3DMark Vantage score and 21,678 in PCMark Vantage. Games tell a similar story, with Far Cry 2 averaging 112FPS with everything cranked up to high. In fact it's safe to say the Stinger will massacre any game out there and will continue to do so for quite some time.

Boot-up time is under 30 seconds and everyday desktop tasks seem to open before you even click them. It's not billed as a green machine, but we were still shocked to see it pull over 700W under load. Lucky it has a Corsair 1000W PSU to keep its components happy.

Of course all this oomph doesn't come cheap. The Stinger variant we tested will set you back $5,499, or $4,999 if you go for dual Radeon 5870s instead of the GTX480s.

Lindsay Handmer



6/10

Enspire Digital AVR-700

Can a high-end media PC replace your home theatre setup?

Enspire Digital
www.enspiredigital.com.au
$2,349

Powerful hardware; quad TV tuners; 4TB HDD.

Pricey; large case; overkill quad-core.

SPECIAL FEATURES
Remote and HTPC keyboard
Gaming capable
Very quiet

The days of relegating the PC to the study are long gone. That massive 1080p TV sitting in your living room is just begging for high-res content, and the Enspire Digital AVR-700 is ready to give it what it wants.

The AVR-700 blurs the lines between high-end PCs and dedicated media machines with a quad-core Intel Core i5 750 – enough for even the most demanding encoding tasks. You also get 4GB of DDR3 and a massive 4TB of total HDD space.

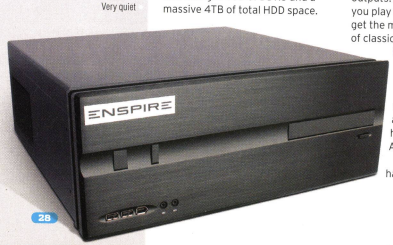
The 700 has dual HD digital TV tuners, each capable of handling two separate channels. In other words, you can watch or record four different channels at once.

A Radeon 5450 handles the graphics side and can output HDMI, DVI and VGA. Audio is fed out directly over HDMI by the 5450; however the 700 also has digital audio and 5.1 channel 3.5mm outputs. A combo Blu-ray drive lets you play the latest HD movies or get the most from your collection of classic DVDs. Of course all this hardware takes up a lot of space, so the 700 is relatively large at 43 x 43 x 17cm. On the plus side the black brushed aluminium case will look at home amongst your other AV gear.

All the media-orientated hardware is marshalled together by Windows 7, with the very versatile and polished Media Center set to run automatically on boot. Control is achieved via the included slick backlit Hauppauge remote control kit plus a Visenta V1 keyboard. For such a high-end machine the AVR-700 is surprisingly quiet during operation – we could not hear it from across a living room. The powerful hardware in the AVR-700 gives impressive performance, with a 5,979 PCMark Vantage score and P1,232 from 3DMark Vantage. The unit will also happily run most new release games at moderate to low settings. The AV7-600 is fairly efficient, averaging 120W when playing a DVD. That drops to 70W when sitting idle and 3W when shut down.

If you have the money to burn on a powerful media PC then look no further than the Enspire.

Lindsay Handmer



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7/10

Logitech Wireless MK710

Redefining extra-long battery life.

Logitech
www.logitech.com
$149.95

Excellent battery life; very comfortable.

Expensive considering the limited feature set.

SPECIAL FEATURES
128-bit AES encryption
Rubber palm rest

Logitech is undoubtedly the king of the mouse/keyboard combination, and its latest dynamic duo has a rather impressive claim to fame. According to the press release, Logitech claims a whopping three years of battery life, courtesy of the dual AA batteries found in both the mouse and keyboard of the MK710 wireless combo. Unfortunately, we didn't have three years to validate those claims though.

This extended battery life is delivered by two means. The simplest of these is the way both devices go to sleep far quicker than previous devices. The other power-saving method is the use of 2.4GHz wireless transmission; older wireless devices used the less efficient, slower 27MHz wireless system. Combine the two and your little rabbit will be drumming well past the 2012 apocalypse.

Other than this remarkable feat, the MK710 is a fairly run-of-the-mill combo. Two sets of legs allow for a four or eight-degree typing angle, while the rubber palm rest makes for a very comfortable typing position. The usual media and shortcut keys are placed at the top of the keyboard, alongside a small LCD screen displaying remaining battery life and the state of various lock keys (caps, scroll and num).

The keys are "Logitech Incurve keys" – in non-marketroid language they're simply concaved, allowing for a better feel. They're a little stiff for our liking, but after a couple of days belting out reviews they started to loosen up.

The mouse is surprisingly small and has one of our favourite Logitech features: a scroll wheel with two modes. Click-to-click is the standard indented mode, but it can also become a free-rolling hyperfast wheel, perfect for scrolling rapidly through long windows.

For such a relatively plain keyboard, the high price tag is a little hard to swallow. It's a very comfortable and sturdy combo, with a decent feature set, but you'll need to use it for at least ten years to recoup the cost in saved batteries.

Bennett Ring



9/10

Acer Aspire easyStore NAS

A very capable server for your home network.

Acer
www.acer.com.au
$599

Excellent performance; great feature set.

Rather large.

SPECIAL FEATURES
Intel Atom D410
1TB Seagate 7,200rpm HD
2GB DDR2
4 x 3.5in hot-swappable drives

APC MAGAZINE apc EDITOR'S CHOICE

It might be targeted at consumers, but that hasn't held Acer back from delivering an exceptionally capable Home Server. Armed with a terabyte of storage and an Intel Atom D410 processor, it delivers both blistering performance and a sweeping feature set.

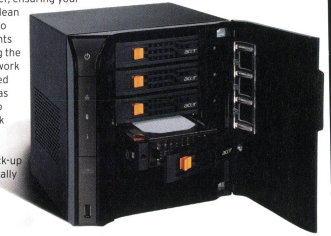
Installation is parent-proof. Simply plug it into the network, power it up and run the installation DVD. It's clever enough to fetch updates off the net while installing, ensuring you've got the most up-to-date server install possible. Once you've enabled guest accounts, it's simply a case of dragging and dropping from your home PCs to the server. During our file test, we copied just over 25GB of movie files from a 300GB VelociRaptor-equipped PC to the server, via Gigabit Ethernet. The transfer took just over eight minutes, giving the overall transfer speed a very healthy 50MB/sec. This speed is testimony to the combination of an Intel Atom CPU, 2GB of dedicated DDR2 memory and a 1TB Seagate 7,200rpm SATA drive.

A feature unique to the H341 is the integrated McAfee Virus scanning, residing in its own tab within the customised Home Server interface. It'll automatically scan each and every file that goes through the server, ensuring your network is kept clean of nasties. It's also got a handy "Lights Out Tab" showing the uptime of all network PCs and scheduled backups, as well as putting it to sleep when the network goes to bed.

The standard Home Server back-up interface is naturally included, making regular back-ups effortless. Naturally it's also got an iTunes server as well as the usual media-sharing features built in.

Combine this excellent performance and feature set with a very reasonable asking price, and we have no hesitation in recommending this for users with very busy home networks.

Bennett Ring



8/10

Sapphire HD 5970 TOXIC

The fastest VGA card, period!

Sapphire
www.sapphiretech.com
$1,199

Fastest VGA card; great cooling; fantastic bundle.

Expensive; really expensive; triple slot.

SPECIAL FEATURES
900MHz core clock
4800MHz QDR memory clock
4GB GDDR5
Triple-fan cooling
Triple-slot
COD: MW2 and Dirt 2 included

APC MAGAZINE HIGHLY RECOMMENDED

While NVIDIA may hold the record for the fastest single GPU video card on the market, ATI continues to hold the record for the fastest, thanks to its dual-GPU HD 5970. It hasn't stopped Sapphire from making the model even faster though.

Sapphire has gone all-out; apart from the standard CDs and cables, included is a mini DP-to-DP connector and two Steam vouchers: one for Call of Duty: Modern Warfare 2, and the other for Dirt 2. Once downloaded, you'll really be able to take the HD 5970 TOXIC for a spin.

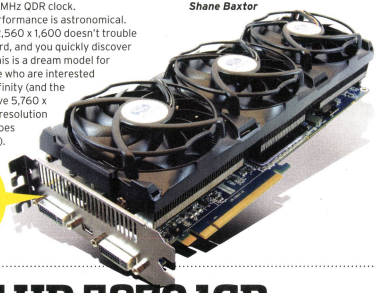
The triple-slot triple-fan-cooled card is huge, and you'll really want to double-check if you've got room (and that you don't need the two slots next to your video card).

Sapphire hasn't just thrown a big cooler on the card and chucked a few games in the box. One of the big changes is the increase in memory from 2GB of GDDR5 to 4GB. The core has been increased an astronomical 175MHz to 900MHz, while that huge 4GB of memory has gone to 4,800MHz QDR, which is a big increase compared to the stock HD 5970 2GB 4,000MHz QDR clock.

Performance is astronomical. Even 2,560 x 1,600 doesn't trouble the card, and you quickly discover that this is a dream model for people who are interested in Eyefinity (and the massive 5,760 x 1,200 resolution that goes with it).

If you've got the money and want the power, the HD 5970 TOXIC 4GB is an extremely tempting purchase. But $1,200 for a video card these days is too expensive, and as soon as people see it they're simply going to turn off.

Shane Baxtor



It's lighting fast, but watch out, it will burn a hole in your wallet.

9/10

GIGABYTE HD 5870 1GB

Is GIGABYTE using the word "Super" too loosely?

GIGABYTE
www.gigabyte.com.tw
$599

Fastest HD 5870; great cooling.

Expensive; small bundle.

SPECIAL FEATURES
950MHz core clock
5000MHz QDR memory clock
1GB GDDR5
Dual fan cooling
OC Guru software

APC MAGAZINE EDITOR'S CHOICE

The latest addition to the Super Overclock series is the much beloved HD 5870, and it's clear that GIGABYTE want to stand out with this model. While the bundle is lacking, with just the normal array of cables and CDs, GIGABYTE has included its new OC Guru overclocking software.

The dual fan setup looks slick, and while the fan can look like a triple slot from certain angles, we can safely say it's only a dual slot.

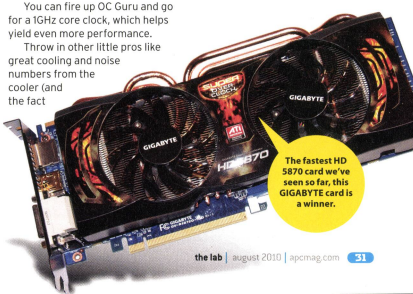
If upgraded cooling wasn't enough for you, we have the overclock – looking at the numbers you instantly feel satisfied that the term "Super Overclock" isn't just being thrown around. Looking at the core we can see it's been increased from 850MHz to a massive 950MHz while the 1GB of GDDR5 has had a healthy increase from 4,800MHz QDR to 5,000MHz QDR.

What this does for performance is huge. The 3DMark Vantage score goes from X9199 to X9983. Getting stuck into games is where performance shines; while the extra MHz isn't needed at the lower resolutions, games like Far Cry 2, BattleForge and H.A.W.X. see some great gains at 2,560 x 1,600.

You can fire up OC Guru and go for a 1GHz core clock, which helps yield even more performance.

Throw in other little pros like great cooling and noise numbers from the cooler (and the fact that it's the fastest HD 5870 on the market) and you can't see much wrong with this model. At $599, though, it's quite expensive – which for some will be a deal breaker. Performance comes at a cost, and that cost is almost $600.

Shane Baxtor



The fastest HD 5870 card we've seen so far, this GIGABYTE card is a winner.

6/10

Sanyo LCD46XR10F

Just add USB stick for full-on PVR functionality.

Sanyo
www.sanyo.com.au
$1,499

Budget price; PVR function; full 1080p resolution. ✔

Slow media player; poor remote setup; muddy sound. ✖

SPECIAL FEATURES
Inbuilt HD digital tuner
Touch-sensitive controls
Integrated media player

The latest budget-orientated range of LCD TVs from Sanyo has just arrived. The 46in LCD46XR10F is the biggest, though still manages to sneak in under $1,500. The 46XR10F has all the features you crave, like a full HD 1,920 x 1,080 resolution and an inbuilt digital tuner. You also get a bundle of inputs, with three HDMI ports, D-Sub, component and the old classic – composite. The glossy black finish won't look out of place in any lounge room, although it did seem to attract a lot of dust during testing. Slick touch-sensitive controls hide in the bezel - letting you still watch TV after the dog eats the remote.

The picture quality is good, especially when viewing HD content. Colours are vibrant without being too saturated and vary very little over a wide viewing angle. The 5,000:1 contrast ratio is decent, though you will still notice a slight glow from the blacks in a dark room. Like most budget-conscious TVs the sound from the Sanyo leaves a lot to be desired. It's indistinct and muddy at any volume and lacks bass when turned up. We recommend using a separate surround sound system to take advantage of high-quality DVD audio. The remote feels solid to use, though the TV would often not respond to our commands unless we were sitting dead-centre.

On the plus side the Sanyo includes a USB port with a range of functions. You can play media files or music, view photos, open text documents and record live TV. The media player has a barebones interface that is slow at times, though it did handle all the files we tried, including HD. The integrated PVR is also basic though functional and can record roughly two hours of TV to an external 8GB flash drive. The 46XR10F slurps about 240W under normal use and drops to 3W at standby. There is also an easily accessible on/off switch on the side of the TV that lets you cut power completely.

Better-than-average image quality and a bunch of useful extra features make this Sanyo a very appealing budget TV upgrade.

Lindsay Handmer



7/10

Soniq QSL460XT

Is it possible to find a quality 46in 1080p TV for under a grand?

Soniq
www.soniqav.com
$998

1080p resolution; low price; HD digital tuner. ✔

Mediocre SD quality; flimsy stand; plain exterior. ✖

SPECIAL FEATURES
Stand with swivel
Vibrant colours
VESA mount-compatible

LCD screen prices are rapidly barrelling towards rock bottom, with the 46in Soniq QSL460XT the latest to break the $1,000 barrier. Everything from the Soniq name to the 'Large' brand batteries in the remote scream budget. But in this case, that's not necessarily a bad thing. Sure, the Soniq is not the prettiest TV around, but the plain black exterior won't look out of place in your living room. The specs are also good, with a full HD 1,920 x 1,080 screen and a 2,000:1 contrast ratio. Three HDMI ports, D-Sub, component and composite inputs handle any of your devices. Unlike many budget LCD TVs, the Soniq comes with a (somewhat flimsy) stand that lets you swivel the TV thirty degrees left or right and a VESA-compatible mount. While noticeably cheap, the wide remote with big buttons feels good in your hand and is pleasant to use.

But what about picture quality? Digital TV looks good, with no real judder or ghosting on fast sequences. Blu-ray discs and other Full HD content looks great on the Soniq. The colours are vibrant and even, the viewing angles wide and the image sharp and clean. SD content is another story, with distracting artefacts visible from low-resolution sources. Normal DVDs looked best when up-scaled by a quality player, while PCs or consoles should be run at the 1080p native resolution. Sound quality is acceptable and, while it lacks bass, the clarity is good. You can also feed sound to a surround system from the digital audio output. The Soniq sucks 240W at full blast, sips 1W in standby and can be turned off with a button hidden around the side of the bezel.

If you want the very best image quality or play a lot of low-resolution video, the Soniq is not for you. If you want to upgrade a CRT or an old SD LCD the Soniq is an easy way to get a very big 1080P screen on a budget. Check out the 460XT in person at your nearest retailer and get some hands-on time.

Lindsay Handmer



NEW

SONY
make.believe



Welcome to your new studio

Announcing Sony Creative Software's updated line of Home Studio products. A complete line of award-winning applications designed to meet your media production needs.

HD video editing? The Vegas™ Movie Studio products combine power and simplicity. Choose from Movie Studio HD Platinum Edition, for expansive video and audio production capabilities, or Movie Studio HD Platinum Production Suite, which offers everything for professional-level video editing, sound design, and DVD/Blu-ray Disc™ authoring.

Looking to produce and record music? ACID™ Music Studio is a powerful digital audio workstation, allowing you to make the most of your performances and sample-based music.

Rely on Sound Forge™ Audio Studio for audio editing. Use it to edit and master professional-quality audio, record live instruments and vocals, edit and restore audio, apply studio-quality effects, convert files and even create karaoke tracks.

Need a single production solution? Imagination Studio Suite combines five powerful Sony applications. Turn your video shoo into Hollywood-style movies. Make your own original music or create remixes and mash-ups of your favorite songs. Organize all your photos. Then, author your project to DVD or burn it to Blu-ray Disc™ and share your digital life with family and friends.

Whether you're a beginner or a professional, however you want to create, Sony Creative Software Home Studio products make it possible to realize your artistic vision.

For more information on our newly updated line of Home Studio products, as well as Sony Creative Software professional products, please visit www.sonycreativesoftware.com.

6/10

Viewsonic PJD6251 3D

Taking the big-screen experience into the third dimension.

Viewsonic
www.viewsonic.com
$1,439

Affordable. ✔

A very basic projector with 3D thrown in. ✖

SPECIAL FEATURES
1.4cm/0.55in Digital Micromirror Device
Vertical digital keystone correction: +/– 40 degrees
3,700 Lumens
120Hz

Now that Blu-ray is common, and everybody has upgraded to a big-screen display, we can all sit back, relax and enjoy our Blu-ray movies, safe in the knowledge that we won't need to upgrade for another decade. Not so fast! 3D is the next big thing, and we're now being asked to shell out another five grand for a set that may or may not make you ill. Thankfully, Viewsonic has come to the party with a much more affordable offer, but what sacrifices have had to be made?

Forgetting the 3D function for a moment, this is a pretty average multimedia projector. Resolution is limited to a mere 1,024 x 768, making it unsuitable for today's HD movies. This is a 4:3 ratio, a strange choice in today's widescreen era. It uses DLP technology to deliver a 120Hz signal, but sadly the colour wheel is obviously of rather low spec. While we couldn't find any information about how many segments it uses, during testing the rainbow effect was easy to spot, suggesting a limited number. Combine the rainbow effect with a 3D image and you have a potent recipe for nausea.

The lens is only a 1.2x zoom and doesn't have any lens shift, so you'll need to position the projector perfectly in relation to your screen. Inconvenient to say the least.

But what about the 3D performance? It should be noted that you'll need the NVIDIA 3D vision kit, which is another $250 or so. You'll also need to run this off a PC – as most Blu-ray 3D players run at a native res of 1,920 x 1080, this projector can't handle them. So it's really aimed at the gaming crowd – and the 3D effect during games is quite pronounced, with real depth to most games. It's just a pity that they must be run at such a low resolution (and with the rainbow effect).

If you want big-screen 3D PC games, this is one of the cheapest options. It's also one of the least compelling.

Bennett Ring



7/10

Englaon 32in Full HD TV

A 100Hz HD TV, without the frills.

Englaon Australia
v.englaon.com.au
$499

e; 100Hz refresh rate; ✔
cess to HDMI inputs.

lighting; poor blacks; ✖
or image processing.

When you are paying under $500 for a 32in full HD television you would expect to have to make some compromises. So, not surprisingly, at this price point, you are purchasing a basic television with a high-definition digital and analogue tuner and minimal inputs.

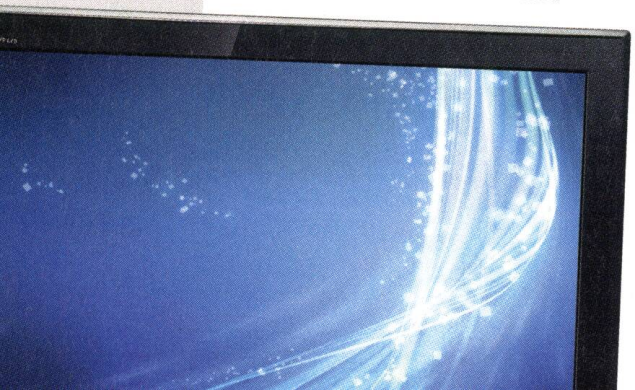
The unit has two HDMI 1.3a inputs, two component inputs, VGA and composite video input and output. There is an SPDIF connector to allow you to connect the TV to a home theatre system, but no headphone socket. Forget about networking, internet TV, DLNA connectivity or even USB or memory card slots, which are now standard features on brand-name televisions – the Englaon is just a TV!

The front of the television looks like an early model Samsung clone with a gloss black panel and round silver circle power indicator light in the middle. The remote control is comfortable to use and, unlike some of the other budget TVs, has buttons to directly select the HDMI inputs.

The unit appears to use similar firmware to many other Chinese televisions as a brand-name television. The instruction manual could use some editing, but is good for a laugh or two with its Chinglish explanations.

It would be unfair to compare the budget Englaon to our reference Sony Bravia (which costs five times as much), but even next to our Lab Wintal unit, the picture quality falls short. Despite having a 100Hz refresh rate, motion could be jerky, particularly during fast-moving scenes and sport. At times player and ball motion appeared to stutter, as the processing engine failed to interpolate frames correctly. Backlighting was uneven and the blacks left much to be desired, with light bleeding through, particularly at the sides.

We couldn't recommend this set



5/10 A.C. Ryan Playon!HD

Beauty is only skin deep.

Legend
www.legendmemory.com
$259

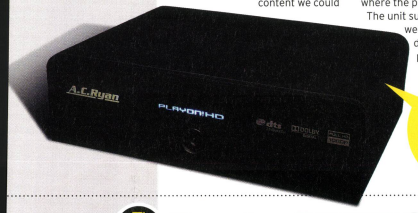
✔ Easy menus; supports most formats; excellent picture upscaling.

✖ Noisy fan; doesn't support IPTV; can't play commercial DVDs.

The A.C. Ryan Playon!HD initially showed great promise. The unit comes with everything that you need in the box (including a component and HDMI cable) and can be preconfigured with a SATA HD ($220 for 2TB) or you can easily install a drive yourself.

The menu system is intuitive and easy to navigate and within minutes we had the unit set up ready to go. It had no problems playing any content we could throw at it from a USB hard disk, with excellent picture quality, good upscaling and smooth motion – even from highly compressed files. There is support for internet radio as well as a torrent client, giving the overall impression of a well-designed media box. Had we stopped there with the testing we would have given it an 8, marking it down for its noisy fan and lack of IPTV support.

However, further testing was where the problems started to show. The unit supports DVD playback, so we connected a USB DVD drive only to find it can't play encrypted DVDs.



We recommend you wait for a firmware upgrade before considering this media box.

The next test was to try to get it to connect to our shares and stream media off a PC. It was able to browse the network, find the workgroup and appear to connect, advising us logon successful. However, we were unable to locate any shares. The supplied documentation didn't help as there is no menu to enter the necessary username and password for logon. Reading the forums on the A.C. Ryan website, it seems that you need to activate the PC's guest account (without any password) to access shares. No way! We tried custom shortcuts with username and password but, no matter what we did, it couldn't access any shares.

Hopefully firmware updates will address these issues, but for now we can't recommend a noisy media box that can't play DVDs, doesn't support IPTV and can't easily access network shares – irrespective of how good the picture quality is!

David Neiger

7/10 Soniq QPB302B Blu-ray/DivX

Blu-ray on a budget.

Soniq
www.soniqav.com
$149

✔ Extremely cheap; great image quality; fast loading; MKV support.

✖ USB and Ethernet can't be used to stream media.

SPECIAL FEATURES

Audio: Dolby Digital, Dolby Digital Plus, Dolby True HD, DTS HD Master Audio, DTS HD high resolution
Disk/file support: BD/BD-R/BD-RE, DVD/DVD+-R(W), CD, VCD, SVCD, audio CD, MP3, WMA

Soniq is an Aussie AV company who, based on the products we've seen in the past, has its sights firmly set on those with anaemic wallets. This Blu-ray player is a fine example – at only $149, it promises to deliver HD movie viewing with all the frills (and at a price the family accountant is sure to approve).

Considering the low price point, it's fantastic to see that this player supports both Dolby True HD and DTS HD Master Audio – audio codecs usually limited to only the most expensive players. It can output this audio via HDMI but also has a coaxial output for less demanding owners.

We were delighted to see both a USB port and Ethernet port on the player – with its support for DivX playback, we assumed this meant the player doubled as a media extender. Sadly our hopes were dashed when we discovered that the Ethernet is limited to BD Live functionality, a waste of an Ethernet port if ever there was one. Adding insult to injury, the USB port is only utilised for firmware updates. To play DivX files on this player you'll need to first burn them to a data DVD and play them from there – a major inconvenience. Thankfully, once you've done so, you'll be pleased to see that this player handles standard DivX, and the superior MKV format, with aplomb.

An affordable Blu-ray option that offers excellent image quality.



As far as playing Blu-ray movies, it does a fine job. Load times are extremely quick, and the unit is silent during operation. Most importantly, image quality is excellent – you'll need an extremely expensive display to tell the difference between this and our Blu-ray player of choice, the PlayStation 3. We couldn't spot any issues on our $4,000 Sanyo PLV-Z3000 HD projector.

While the lack of media extender functions is disappointing to say the least, especially considering most of the necessary hardware is already included, there's no denying that the QPB302B offers an extremely cheap Blu-ray experience.

Bennett Ring

9/10

Plantronics Discovery 975

The newest bluetooth headset is almost perfect.

Plantronics Australia
www.plantronics.com.au
$179

Stylish; excellent noise reduction; simultaneously connects to two phones.

No choice of colour.

SPECIAL FEATURES
Dual-mic AudioIQ technology
WindSmart wind protection

APC MAGAZINE — apc — EDITOR'S CHOICE

We think we might have come close to the perfect Bluetooth headset with the Discovery 975. Plantronics has taken everything we liked in the Discovery 925 (excellent sound quality, ability to simultaneously pair to two phones) and made further improvements.

The Discovery 975 is definitely a business headset, with a thin microphone boom and diamond shaped headset that slips comfortably into your ear cavity without any annoying over-ear clips. The headset now boasts two microphones and improved noise reduction, which helps remove most (but not all) background noise and cuts wind noise significantly.

Whilst many headsets allow you to pair to multiple phones, the Discovery 975 is one of the few headsets that allows you to connect to two phones simultaneously. This means that you can receive a call either from your personal or work mobile without having to pair the headset, although you cannot switch phones mid-call.

Battery life of the headset is around seven days standby (four days if using multiple pairing) and is claimed to provide around five hours of continuous talk time. With normal usage we could easily obtain several days between charges.



The carry case also has an inbuilt battery that provides three recharges, so you should never run out of power even if you are a heavy mobile user. A small LCD display on the charger case shows you how much charge is left in both the headset and carry case, as well as indicating when charging is taking place. Both the carry case and charger fit neatly inside a supplied tough bag, so you can take the headset with you when you travel.

Our only criticism is that the unit is only available in black, leaving a few disappointed fashionistas to bemoan the fact that they can no longer purchase a gold, silver or hot pink headset.

David Neiger

7/10

Garmin nuvi 1690

Guidance to the cheapest petrol is a big plus.

Garmin
www.garmin.com
$599

Access to Google Local search and other online features; intuitive user interface; can look up cheap petrol prices.

Expensive; online features for a year only, basic mapping interface.

SPECIAL FEATURES
Built-in web access
Whereis maps
Where Am I emergency locator

The first 'connected' GPS has finally arrived on our shores in the form of the Garmin nuvi 1690.

The nuvi 1690 doesn't look much different to older PNDs, with a bright 4.3in 480 x 272-pixel resistive touchscreen display, rear-mounted speaker and basic suction cup windshield mount.

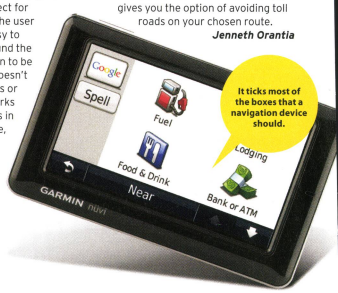
A non-removable SIM card provides online access to Google Local Search results, service stations with the cheapest petrol, flight times, weather forecasts and the latest currency rates. You also get access to Gamin's Ciao! network, which shows you the current location of other 1690-toting friends. Garmin offers its online services free for a year, after which you'll have to pay $99 a year to keep it active.

The 1690 ticks most of the boxes for a flagship navigation device, with Real View Advanced Lane Guidance, safety camera alerts (red light and speed cameras, but no school zones), Bluetooth hands-free, spoken street names and real-time traffic alerts. Oddly, it uses the internet connection for traffic alerts rather than the prevalent (and free) FM transmission system.

Navigation performance is decent, but it doesn't quite match what we'd expect for the pricetag. The user interface is easy to use, but we found the mapping screen to be primitive – it doesn't show sign posts or any 3D landmarks like other PNDs in this price range, and the Real View feature is limited to a static image that replaces real-time mapping for a couple of seconds when you get to a major traffic junction.

Routing and rerouting is on the slow side, and when you lose the GPS signal in tunnels, it displays a large 'Poor satellite reception' dialog box. We also missed the feature available on other devices where it gives you the option of avoiding toll roads on your chosen route.

Jenneth Orantia



7/10

Olympus Mju Tough 3000

Stronger, better and in more colours.

Olympus
www.olympus.com.au
$399

Great LCD screen; rugged design; waterproof; looks great.

Image quality could be better; can be slow under some conditions.

SPECIAL FEATURES
12 Megapixel
HD Movie capability
1GB internal storage
Panorama Mode
Face Detection

Olympus has led the way in rugged compact cameras with its range of Mju Tough compacts. One of the latest (and the first with HD video capability) is the Tough 3000. Like its predecessors, the 3000 is shockproof to 1.5 metres, scratchproof, waterproof to a depth of 3 metres and can withstand temperatures as low as -10°C.

The 12 megapixel CCD sensor captures decent images that will appeal to all but the fussiest photography enthusiast. Images are generally sharp but can show a little too much grain in all but the best lighting situations. Colour saturation is great except for underwater shots that still hold a blue cast despite the Tough 3000's powerful flash.

HD movie capability is an added bonus. Captured at 720p, its quality is on par with other compacts but still far from being a camcorder replacement. There are some pretty cool features in the Tough 3000 that we can imagine some users will use. Face recognition is a must with the 3000 being able to recognize up to 12 faces per frame. Not only that, you can 'tag' friends and family so the camera will recognize them in future photos and group them together in pre-defined collections of your choice. So now you can browse for images of particular people 'in-camera.'

The addition of 1GB of internal memory as well as an SD card slot gives you that little extra space that means you won't miss out on anything if your card fills up. In-built Panorama is another added feature that works well and is sure to prove useful. For the asking price, the Tough 3000 is a good compact that is sure to give years of reliable performance.

Christopher Zammit



8/10

Flip MinoHD

Shooting impromptu high-def videos has never been easier.

Cisco
www.theflip.com.au
$299

Ridiculously easy to use; built-in USB connector; compact and stylish design.

No image stabiliser; memory isn't expandable; easily scratched.

SPECIAL FEATURES
1/4.5in HD CMOS sensor
H.264 video compression
2x digital zoom

APC MAGAZINE RECOMMENDED

The MinoHD is one of those delightfully easy-to-use gadgets that just feels right the first time you pick it up. There are no complicated buttons, settings or menus to master; just turn it on, find what you're recording in the viewfinder and press the big red button to start shooting. Too easy!

The updated model has double the recording time of two hours (which corresponds perfectly with its two-hour battery life), a slightly larger 2in LCD display, HDMI output (the previous one had composite output only) and a sexier brushed metal casing.

Otherwise, it's the same pocket HD camcorder that we loved the first time around, with a switchblade-style USB connector that flips up from the top, 720p high-definition recording at 30 frames per second in H.264 format, and a mini HDMI port on the bottom for connecting it to a high-definition TV. The record button is slightly recessed to make it easier to find by touch, and the rest of the buttons are touchscreen controls that can only be pushed when the Flip is powered on.

The MinoHD turns on in a swift two seconds, and the screen doesn't overwhelm you with obscure icons: just the record time you have remaining while it's in playback mode and the total time you've been recording while you're shooting, plus a battery icon in the bottom right.

Video quality is about what you'd expect – it's significantly better than camera phone footage, but it lacks the sharp fine detail that you get from larger HD camcorders. The main thing to be aware of is that it doesn't have an image stabiliser, so video that you shoot while on foot will be shaky to say the least.

Making a movie out of your footage is equally easy with the FlipShare desktop software, which is stored on the MinoHD. You can opt for the 'Magic Movie' option, which selects highlights from your clips, or do it manually for more control. We preferred the latter, as it gave the option for adding credits and a soundtrack. FlipShare has options for burning to a DVD, emailing it and uploading it to Facebook, YouTube and MySpace.

Jenneth Orantia



best apps
LATEST SOFTWARE



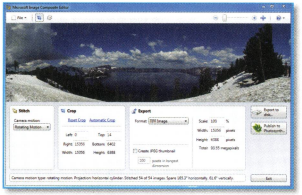
PC software

There's an app for pretty much anything you want to do. Here we take a look at our favourite ones.

Image Composite Editor

Stitch your images together to make them 3D

There are many panoramic stitchers out there, not to mention Photoshop's photo merge function, but we'd have to say that Microsoft has blown us away with its Image Composite Editor. Not only does it let you create panoramas from overlapping photos taken from a single camera angle, but it's able to stitch them together into 360 degree cylindrical views. You give it a set of photos and it pulls them together into one single image that you can share with friends, or upload to Microsoft's Photosynth site, where it's converted into 3D format. The finished panorama can also be saved in a variety of image formats, ranging from JPEG and TIFF to the multi resolution tiled format used by Silverlight's Deep Zoom and by the HD View and HD View SL panorama viewers. Importantly, it's able to handle large, gigabyte plus images, which means that you're able to create some pretty high resolution panoramic landscapes.



Free > **Microsoft** > **bit.ly/4wffUI**



Aviary Roc Music Creator

It's a web application that comes pre-packaged with sound with all the common insturments but what makes it a pleasure to use is that its 3-pane music creation interface is extremely logical for anyone who knows nothing about music. Creating music is as easy as dragging sound from an instrument in the left panel into the middle, beats pane, and then applying different tempo and beat values and effects. When you save the finished product, you get a URL with embed codes to place the music on any web page.

Free > **Aviary** > **bit.ly/c6b0Yo**



Total Commander 7.55

Most don't understand what compels various tech users to use a piece of software that harks back to the days of the Norton Commander, back when MS-DOS ruled. Total Commander 7.55 is a file manager for Windows that eschews looks for brutal and speedy file management functionality. And that's the whole point, some of us want to get the job done quickly, without a pretty file manager, and get a lot more functionality than Windows Explorer, like packing and unpacking files, access ftp servers, comparison of files by content, and so on.

Free > **Total Commander** > **bit.ly/g7H66**



LastPass

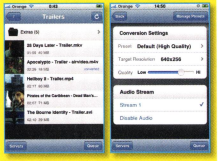
We're often asked by readers who are exasperated by the number of web passwords they need to remember if there is a better way. When we tell them to use a password manager, the response is often "but is it secure?" Several *APC* staff use one, LastPass, so we think the answer is a resounding yes. A plugin for IE, Firefox and Chrome, LastPass intercepts any passwords or data being entered into a web field or form, encrypts them on your PC and stores them on its servers. As a result, you can access LastPass and your password info from various PCs.

Free > **LastPass** > **lastpass.com**

App Store

Peter Dockrill scours the App Store and reviews the best apps available for the iPhone and iPod touch.





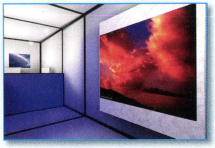
Air Video

One of the frustrating things about (non-jailbroken) iDevices is the way that the video formats they'll play by default are severely limited (which means a lot of time spent re-converting video files on your PC before they'll work for you). Cue: Air Video. It streams video to your device over Wi-Fi, converting for you on the fly. So, as long as you're in your router's range, you can watch anything (well, lots of video formats) stored locally on your PC or Mac.

$3.99 > Matej Knopp > www.inmethod.com

3D Gallery

This one reminds us a little of those old '90s-style screensavers, where all your digital photos end up in a 3D glide-through environment. And that's pretty much what it is – except, instead of it being a screensaver, it's an interactive 3D gallery. You control your movement, and can view up to 3,250 pictures in your virtual gallery. A nice way to explore your photo library on a rainy afternoon (and maybe see some of your snaps in a new light).



$2.49 > Christoph Arnold > www.caweb.de



Hipstamatic

The thing about old analogue equipment (be it vinyl records, old cameras, etc.) was that it had a certain *warmth* to it. Sure, newer digital software and hardware makes things ultimately cheaper and more accessible – and opens up creativity in all sorts of innovative ways – but a lot of the fuzzy charm of older technologies got lost along the way. The remedy: nostalgia apps. Hipstamatic (love that name) looks and feels like an old analogue camera. Fun.

$2.49 > Synthetic Infatuation > hipstamaticapp.com

Remote

No need to get off the couch; use your iPhone to control iTunes playback.

One of the interesting things to note about Remote is that it's made by Apple itself, and, at time of writing, of the tens of thousands of apps available in the App Store, only nine (count 'em) are made by Apple. This really shows the extent to which Apple encourages developers towards the App Store – ie. the company is very careful not to muddy the waters with its own competing software. But, anyway, onto this simple but remarkable app. In fact, Remote is about as simple as an app can get, and recalls that old advertising slogan: "The simplest things in life are often the best." Remote turns your iPhone or iPod touch into a remote control for iTunes. That's pretty much it, but it's free – so you can't really complain. And given that Apple actually sells a hardware remote control (for $25), it's even more of a bargain. Setting up Remote is simple. It pairs with an iTunes library via Wi-Fi by way of a simple passcode. Then you can access Genius, Playlists, Artists, Albums, Search and more, just like you're physically at your computer (or Apple TV). A victory for music-loving couch potatoes everywhere.

Free > Apple > www.apple.com.au





SSD 2010 UPDATE

Solid State Drive technology is no flash in the pan — it's the future of storage and it's getting better year on year. **Bennett Ring** takes a look.

Back in late 2009 we took an extended look at SSDs, drives which have the ability to turn a plodding PC into a multi-tasking speed demon. During the roundup it became clear who was leading and who needed to play catch-up. How things have changed. Since then we've seen several new players enter the market, and the segment has been turned on its head. Leaders become the losers, while budget brands have taken the lead.

TRIM

SSD drives suffer a performance decrease over time due to the way each drive erases and writes to blocks of memory. Thankfully there's a solution called TRIM. It's native to Windows 7, but in late 2009 not every drive supported it. This is no longer the case – every drive we tested here now supports TRIM, ensuring that performance remains optimal over time.

SANDFORCE

One company has shaken up the SSD industry like no other. Its name is SandForce, and its controllers are the hottest chips on the SSD scene. Established in 2007, it's only the last few months that its controllers have started to see widespread adoption. One of the company's mantras is to deliver extreme performance from cheaper Multi Level Cell (MLC) memory, where in the past the more expensive Single Level Cell (SLC) drives were seen as the fastest. And it succeeded. As our benchmarks show, those drives outfitted with SandForce controllers deliver phenomenal speeds.

Indilinx was one of the major players late last year, and its Barefoot controllers are still proving to be popular. Intel has seen its performance lead eroded by the newer controllers, and is now starting to target the value segment instead. Toshiba, a company that was absent from the last roundup, has also started to make its mark on the scene, but not to the same extent as SandForce.

SSD I/O PERFORMANCE

	Iometer total I/Os per sec	Crystal Mark 4k Write (MB/sec)
2009 - Corsair X128	2,247	18
2010 - Patriot Inferno 200GB	5,927	49

UNDER REVIEW



A-RAM PRO Series 256GB



Corsair Nova Series


Intel X25-M (80GB) 256GB


Intel X25-V (40GB)



Kingston SSDNow V+ Series 64GB


OCZ Vertex Limited Edition (100GB)



Patriot Inferno 200GB



WD SiliconEdge Blue 128GB

PERFORMANCE

When we last tested SSD drives, many focused on sequential data transfers – that is, filling up extremely large sections of the drive at a single time, such as copying over tens of gigabytes of data. That's great for storing and retrieving large files, but it's no good when you're running an operating system or application off a drive. In these circumstances, it's far more important to have better read and write performance of smaller file sizes, as well as higher I/O operations per second. And it's in this scenario that most SSDs are used.

It seems that SSD manufacturers have figured this out, as performance in this regard has soared through the roof. The table on page 46 shows just how much these areas have improved.

HOW WE TESTED

Testing SSDs is still a relatively new art, and a difficult one at that. Due to the way these drives degrade over time – and as some drives are better at specific tests than others – we had to be very careful in our benchmarks. Read on to see how our SSD testing environment has evolved since the last roundup.

To ensure our testbench wasn't the limiting factor, it was loaded with high-end components:

- Intel i7-870 CPU
- Sapphire Vapor-X ATI Radeon 5870 video card
- 4GB HyperX DDR3 1,600MHz
- 300GB WD VelociRaptor
- Windows 7 Premium 64-bit

Within the BIOS our SATA controller was set to AHCI mode. All drives were tested with the default firmware – with new versions released every other day, it's simply impossible to keep them up to date, and using the default firmware should provide good insight into the manufacturer's grasp of SSDs.

As explained in our last SSD roundup, these drives have a tendency to slow down as they're filled with data due to the way they write. Take an SSD out of the shrink wrap and it'll be blazing fast; six months later the same drive could slow down to mechanical drive speeds, or worse. To replicate this phenomenon, we filled each drive with junk data before testing, and then deleted it all. We then fired up a handy little app created by the folks at OCZ called ForceTRIM, which forces Windows 7's TRIM function to clean up the drive. Only after this laborious task could the fun benchmarking begin.

From there we used a new benchmark that has been doing the SSD rounds called AS SSD, created by Alex Intelligent Software, with the sole purpose of synthetically testing SSDs in a manner that replicates real-world use. We also used our favourite disk test, CrystalDiskMark 3, to confirm these results, as both tests focus on the same areas of performance. Then it was time to dust off our old Iometer from Intel, using the same boot profile that we used in the last SSD roundup, built to deliver a rough approximation of performance in a Windows install.

PCMark Vantage is a favourite when it comes to putting hardware through the wringer, and has its very own dedicated HD section to test a variety of different usage scenarios. However, after testing several drives using this, we noticed extremely strange discrepancies. Simply rerunning the test on the same drive in the same testbench saw results fluctuating by as much as 100%. As a result we've removed this from our SSD tests until we can resolve the issues. The final weapon in our benchmarking arsenal was HD Tach. Sure, it's old and simple, but some folks still swear by its accuracy.

Testing an SSD using a single synthetic benchmark is guaranteed to return some, shall we say, interesting results. However, we're comfortable that our combination of four different tests combine to provide the best possible indication of performance.

SSD LIFESPANS

One thing that we can't test is how long these drives last — we simply don't have the ability to bend the space time continuum to perform the necessary tests. We asked several manufacturers what the failure rate on their drives were, and none of them replied with any hard percentages or statistics. Rumours abound that certain drives have suffered shocking failure rates of up to 20% and 30%, an extremely worrying — if unprovable — figure. However, anecdotally we can say that we've noticed an abnormally high failure rate on the *last generation of drives* — but not the latest generation tested in this roundup. Several of the *APC* team have had SSDs from the last gen fail on them, and the author has personally seen two fail in the past six months. As a result we strongly recommend frequent backups, and to take special note of the warranty for your chosen drive. Many of the new controllers claim to have focused on reliability, so hopefully the failure rates of the past remain firmly in the past.

What do I look for?

In a good solid state drive. . .

PRICE
Price per gigabyte is the important metric here. Do the math, you may be paying above the odds.

TRIM
Support for drive TRIM is now widely supported, but older or cheaper drives might lack this important function.

CONTROLLER
SSD's are judged more by the controller they use than the brand on the box. Controllers from SandForce and Indilinx are recommended.



PERFORMANCE
Write performance can be significantly slower than reading from the disk. A more balanced drive gives a better experience.



A-RAM PRO Series 256GB

@ www.a-ram.com

✔ Cheapest per gigabyte; strong sequential performance.

✖ Slow at small read/writes; poor warranty.

A-RAM is a Hong Kong-based company with a focus on delivering affordable SSDs. At a mere $3.12 per gigabyte it's safe to say it's delivered on this goal. Its Indilinx Barefoot controller is a popular choice, being one of the most common SSD controllers on the market. This helps contribute to the lower overall price of the drive. The Barefoot has been around for a while though, and – despite firmware updates – seems to be stuck with the thinking that sequential read/writes were the be all and end all.

It uses the cheaper MLC chips, and requires the use of a jumper for flashing. There's no 2.5in to 3.5in mount included in – in fact, there's nothing in the pack except the drive and jumper. It has a meagre two-year warranty – slightly worrying considering it's the shortest in the roundup.

Considering the budget price point, we weren't expecting stratospheric performance. HD Tach showed strong sequential performance, with the A-RAM placing fourth overall. CrystalMark and AS SSD backed up these numbers with excellent sequential performance. But sequential performance isn't really that important – we're more concerned with the drive being able to handle lots of I/Os per second and fast read/writes of small files. And it's here that the drive shows its budget focus, with a 400% slower 4k write time than the leaders of the pack.



Corsair Nova Series 256GB

@ www.corsair.com

✔ Great price.

✖ Poor warranty; lacklustre performance.

In our last SSD roundup, Corsair's X128 proved to be our pick of the bunch. Unfortunately the same X128 sample died just a week ago, luckily we've got this new Corsair instead. Doubling the capacity of the X128, the 256GB Nova is well priced at just $3.62 per gigabyte, the second cheapest in the roundup. Like the other cheapie, it too uses the Indilinx Barefoot controller – great at sequential performance, not so stellar when it comes to tiny tasks. Corsair helpfully includes a 3.5in bay mount, while the two-year warranty is scarily identical to the other Indilinx-powered drive, the A-RAM.

Considering the last Corsair we tested blew our performance socks off, we had high hopes for this drive. But it wasn't to be, with the Nova delivering middling performance. It performed admirably in HD Tach and the longer sequential read/write tests, but throw anything involving 4k files at it and it doesn't know what to do, coming dead last in our CrystalMark 4k write test. Iometer showed that it could only handle 2,070 I/Os per second, a long way from the 5,927 I/Os per second of our roundup leader.

How things have changed, with Corsair going from the top of our last roundup to one of the least desirable in today's. Like the A-RAM, it's still a massive improvement on a mechanical drive, but it can't compete with the new SandForce powered beasts. It just goes to show how long six months in the SSD world is.



Intel X25-M (80GB)

@ www.intel.com

✔ Anecdotally, the brand is more reliable than other SSDs.

✖ Very expensive; disappointing performance.

Rewind one year, and Intel drives didn't just hold the performance crown – its dominance was so complete that it owned the entire performance empire. Nothing could come close to Intel SSDs, especially when it came to the itty bitty files that determine how responsive your PC feels while the OS is writing to the hard drive. So what has Intel done over the past year to maintain that lead? Apparently not much.

Before we look at the disappointing performance figures, let's look at that price. Ouch. $7.49 per GB, making this by far the most expensive drive in the roundup. Thankfully the three-year warranty goes some way to justifying this... until we see the same warranties on much cheaper drives.

Then we see the disappointing benchmark results. Where Intel was once several lengths ahead, it now finds itself stuck in the middle. While the HD Tach results were exceptional, everything else was dismal. It came in at just over half the speed of the best drives in Iometer, and was one of the worst in CrystalMark's. However, it did redeem itself in the 4k tests, outshining the drives that used older controllers.

For the price though, we expected much more. If Intel is to continue to be the most expensive when it comes to SSD storage, it needs the performance numbers to back it up.



Intel X25-V (40GB)

@ www.intel.com

✔ Lowest overall price.

✖ High price per GB; average-to-low performance.

The V stands for value, and at first glance the price suggests the same. For only $275 you can shift your OS to an SSD, an Intel one no less. Now that's a bargain... or is it? Looking at the $6.88 per gigabyte, this is the second-most-expensive drive in the roundup. Not quite the value offering suggested. Having said that, overall it is the cheapest, and you can squeeze an operating system onto it.

However, at only 40GB, you'll soon find that no matter how careful you are, you're going to have a full drive. Trust us – we've been there. It'll start with your virus scanner ("I need to check my files quickly"), then iTunes ("After all, I do sync my phone every few hours"), and before you know it your drive is showing up as a glowing red bar in My Computer.

You might be more disciplined than us – and get away with a mere 40GB. In which case this drive's disappointing performance is bound to be a letdown. Sure, it's better than the Indilinx-controlled drives, but it's left eating SandForce's dust. In many of our tests, the X25-V came dead last.

Oh how the mighty have fallen. If there is a reason to go with the Intel drives, it's that we've heard of fewer failures with the brand than the others. But with the new SandForce drives also claiming amazing reliability, Intel needs to go back to the drawing board sooner rather than later.



Kingston SSDNow V+ Series 64GB

@ www.kingston.com/anz/

✔ Excellent accessory bundle.

✖ High price; lack lustre performance.

Kingston pitches this drive as part of an SSD upgrade kit, and it has done a great job of doing so, including every accessory you could possibly need. The usual 3.5in adaptor is included, along with an external case that can convert this drive into a portable USB drive. A SATA cable is also packed in, but most impressive is disk-mirroring software. This allows you to mirror your existing mechanical drive's content onto the new SSD. Having said that, we tried to use the software and encountered a bunch of errors with the new install, and further examination suggests that cloning to an SSD is a bad idea.

With such an excellent starter kit, it's a pity that the drive itself isn't that exciting. While it's aimed at the value segment, the price per GB is a hefty $5.30. The three-year warranty is reassuring, but still behind the five years offered by Patriot's SandForce behemoth. A Toshiba controller is used within this drive, making this the first Toshiba-powered drive we've tested.

Sequential performance in CrystalMark was fantastic, leading the charts, but the rest of the story isn't so rosey. In most tests the Kingston drive was in the tail end of the performance – very surprising considering it's in the high end of the pricing regime.

While we admire the overall package, the fact remains that the drive itself is overpriced yet under-delivers.



OCZ Vertex Limited Edition (100GB)

@ www.ocztechnology.com

✔ Excellent small file and I/O performance.

✖ Not so great at sequential files.

OCZ took a big gamble when it signed up with SandForce. At the time, SandForce's controllers were unproven. It turned out to be a smart punt though, with SandForce delivering spectacularly.

The controller in this drive is a version of the SF-1500 used in Enterprise drives, and boy does it deliver. It's so special that OCZ only made an extremely limited number, making them rarer than hens' teeth. The three-year warranty is healthy, while the price per GB is only $4.99, putting it squarely in the middle of the bunch. The same can't be said of its performance, with this drive performing very well, provided we look at the tests that we value most.

Where the older controllers focus on sequential transfers at the cost of small writes, this drive seems focused on the opposite. It doesn't do amazingly well when we look at HD Tach or the sequential results in CrystalMark or AS SSD, but it's in the highest rungs of the performance ladder when we examine the smaller file transfers. At 4k this drive is a speed demon, second only to the other SandForce drive, and leading the other drives by a large margin. This makes it perfect as a drive for your OS, although it's not quite so good for a video or image editing storage drive, where longer file transfers are more important.

Considering the excellent price point and solid warranty, this drive is hard to ignore. Highly recommended.



Patriot Inferno 200GB

@ www.patriotmemory.com

✔ Fantastic performance; long warranty; great price per GB.

✖ Past experience with the brand's reliability is worrying.

We'll be honest with you – the *APC* team has personally had two of the older-generation Patriot drives fail on us. If this new Patriot drive hadn't performed so spectacularly, we wouldn't have given it a second look. But it blew the opposition away, leaving us with no choice but to rethink our position on Patriot.

At its heart lies the new SandForce SF-1222 controller, which shares many similarities to the OCZ drive's controller. However, this drive has a newer firmware, and the results are amazing. Before we get to that, we should point out that this drive's five-year warranty is unheard of in consumer SSDs, going a long way to restoring our faith in Patriot's reliability. It's also affordable, at $4.50 per GB.

Where most drives tend to be good at either sequential transfers or small file transfers (but never both), the Inferno is adept at whatever duty it's undertaking. It's not quite the best at sequential transfers, but it's also not totally inept. And the slight performance drop with larger files is offset totally by the number of benchmarks it won – easily scooping more performance metrics than any other drive.

We're left very impressed by this drive, despite our earlier misgivings based on our prior experience with Patriot. Given that this drive uses a totally different controller than our two dead drives, we're willing to give Patriot another shot.



WD SiliconEdge Blue 128GB

@ www.wdc.com

✔ A solid brand, with solid performance.

✖ Very expensive; doesn't shine in any area.

We tried very hard to find out which controller this SiliconEdge Blue used – after checking with the local Western Digital public relations guy, we discovered that Western Digital's official line is that it does not reveal the manufacturer of the components used within its SSDs. It's a pity, as it would give us a better idea of why this drive performed the way it did.

As with most Western Digital products, pricing is at a premium for the SiliconEdge, costing a whopping $6.88 per GB. A three-year warranty is pretty stock standard thest days, better than the meagre two years of certain drives but still well short of Patriot's five-year whopper.

When we first looked at this drive a few months ago, we gave it a good rating. . . but that was well before we'd seen the new SandForce drives that have clearly cleaned up in this roundup.

Since then, as our benchmarks show, this drive sits smack bang in the middle of the performance charts. It's taken a balanced approach, offering solid performance in both sequential transfers and the smaller I/O operations required by applications.

As such, it's not really noteworthy in any regard, other than its high price point and mystery controller.

AS SSD - HIGHER IS BETTER

*Higher is better	Seq Read (MB/s) - higher is better	Seq Write (MB/s) - higher is better	4K Read (MB/s) - higher is better	4K Write (MB/s) - higher is better	4K 64 Thread Read (MB/s) - higher is better	4K 64 Thread Write (MB/s) - higher is better	Access Time Read (ms) - lower is better	Access Time Write (ms) - lower is better
Patriot Inferno 200GB	211	131	16	43	124	94	0.255	0.251
OCZ Vertex Limited Edition	209	61	15	41	118	54	0.271	0.296
Intel X25-M (80GB)	256	84	14	32	149	60	0.094	0.127
Intel X25-V (40GB)	184	42	15	31	128	37	0.098	0.131
WD Silicon Edge Blue 128GB	241	136	11	11	18	12	0.329	0.291
A-RAM Pro Series 256GB	236	176	17	10	69	11	0.23	0.431
Corsair Nova Series 256GB	225	185	17	9	66	10	0.231	0.452
Kingston SSDNow V+ Series 64GB	208	155	10	8	13	4	0.31	0.633

HD TACH

*Quick = 8mb zones; Long = 32mb zones	Quick Random Access (MS)	Quick Average Read (MB/s)	Long Random Access (ms)	Long Average Read (MB/s)
Intel X25-M (80GB)	0.1	207	0.1	208
Corsair Nova Series 256GB	0.1	200	0.1	199
Intel X25-V (40GB)	0.1	194	0.1	194
A-RAM Pro Series 256GB	0.1	192	0.1	188
WD Silicon Edge Blue 128GB	0.2	177	0.2	173
Kingston SSDNow V+ Series 64GB	0.3	167	0.3	178
Patriot Inferno 200GB	0.3	152	0.3	141
OCZ Vertex Limited Edition	0.2	146	0.2	138

IO METER BOOT TEST

	Total I/Os per second - higher is better	Total MB/s - higher is better	Average I/O response time (ms) - lower is better	Max I/O response time (ms) - lower is better
Patriot Inferno 200GB	5,927	241	11	66
OCZ Vertex Limited Edition	5,770	234	11	66
Intel X25-M (80GB)	3,393	138	19	344
Intel X25-V (40GB)	2,517	102	25	66
WD Silicon Edge Blue 128GB	2,247	91	29	445
A-RAM Pro Series 256GB	2,206	90	29	246
Corsair Nova Series 256GB	2,070	84	31	269
Kingston SSDNow V+ Series 64GB	1,781	73	36	979

CRYSTAL MARK

*Higher is better	Seq Read (MB/s)	Seq Write (MB/s)	512k Read (MB/s)	512k Write (MB/s)	4k Read (MB/s)	4k Write (MB/s)
Patriot Inferno 200GB	219	138	210	137	15	49
OCZ Vertex Limited Edition	212	84	200	85	14	48
Intel X25-M (80GB)	263	84	202	88	15	39
Intel X25-V (40GB)	196	43	156	45	19	38
WD Silicon Edge Blue 128GB	241	145	191	107	12	13
A-RAM Pro Series 256GB	255	159	188	143	19	10
Kingston SSDNow V+ Series 64GB	220	183	202	97	14	10
Corsair Nova Series 256GB	248	175	168	192	19	10

AS SSD COPY TESTS

*Higher is better	ISO (MB/s)	Program (MB/s)	Game (MB/s)
WD Silicon Edge Blue 128GB	82	85	78
Patriot Inferno 200GB	95	84	90
A-RAM Pro Series 256GB	102	78	93
Kingston SSDNow V+ Series 64GB	104	77	91
Corsair Nova Series 256GB	100	75	92
OCZ Vertex Limited Edition	67	66	69
Intel X25-M (80GB)	93	61	81
Intel X25-V (40GB)	51	43	46

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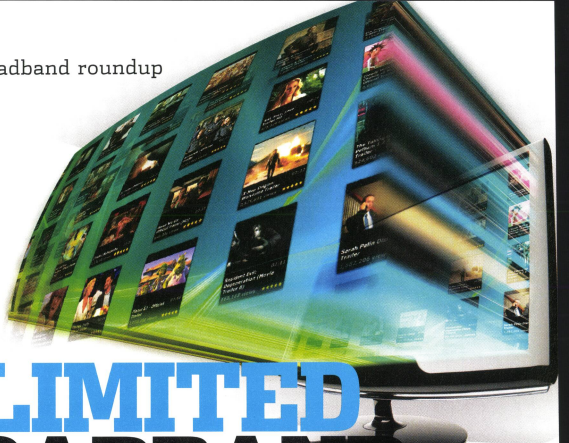
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3GB	**$29.95** per month
6GB	**$39.95** per month
7GB	**$49.95** per month

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www.spin.net.au **1300 450 377**

* Nexus plans are subject to our Acceptable Use Policy (AUP). 39c flagfall applies for all non-local and non-national calls. Timed calls are billed in 30 second increments. After the cap time has passed, you will be charged at the nominated rate as detailed on our website. Minimum total cost for 5GB Nexus over 12 months $959.40 (calls which are not included are additional). Nexus plans are only available to Residential customers. Early termination fees apply. Direct Debit or Credit Card only.
^ Naked ADSL2+ plans are subject to our Acceptable Use Policy (AUP). Other calls are additional. Optional 120GB Off-Peak is available for $4.95 per month and is shaped at 1500Kbps (1.5Mbps) during the off-peak period of 2am-9am AEST/AEDST only (please visit our website for more details). Minimum total cost over 1 month $248.95 (includes set-up fee). Early termination fees apply. Direct Debit or Credit Card only. # $15 modem delivery fee applies. Coverage not available in all areas. Data usage includes both downloads and uploads. Excess usage over the data limit is 14c/MB. 1GB minimum total cost over 24 months $373.80. 3GB minimum total cost over 24 months $733.80. 6GB minimum total cost over 24 months $973.80. 7GB minimum total cost over 24 months $1213.80. Early termination fees apply. Direct Debit or Credit Card only. Unmetered Content is only available on fixed-line broadband services (exclusions apply, see website for more details).



UNLIMITED BROADBAND

Jenneth Orantia takes a look at the top internet options, no matter what your usage model.

If you've been puttering along on the same internet plan for longer than you can remember, you'll be amazed by how much more for your dollar you can get these days. The last year has seen fixed broadband prices plummet to an all-time low, making it an affordable option for all types of users.

High-volume downloaders in particular now have a much wider selection of plans to choose from at different price points, whether it's a plan that allows for unlimited downloads during the off-peak period, a plan with a generous data allowance that you can use at any time, or a truly unlimited plan, the likes of which have started popping up in the last six months.

Price cuts across the board mean that you don't have to spend more than fifty dollars to get an excellent deal on broadband anymore. TPG has been the most aggressive ISP in this regard following its recent acquisition of PIPE networks (operator of the largest internet exchange in Australia), but other ISPs like AAPT and iPrimus are quickly following suit.

The first step in assessing what your broadband options are is checking which ISPs are operating in your area. Broadband Choice (**http://bc.whirlpool.net.au**) can display all of the ISPs that operate at your local exchange if you enter your landline telephone number – if you don't have a landline, you can enter the phone number of a neighbour (as they'll be on the same exchange as you) or simply navigate the ISPs by state for a general overview of what's available where.

Whether you want an active phone service or not will dictate the type of fixed broadband you use. Cable internet is the fastest and most reliable type of broadband, with maximum download speeds of 30Mbit/s, and you don't need to have a phone line to use it. The catches are that it's only available through Telstra and Optus, it's more expensive than ADSL and ADSL2+, and it's only available in limited locations.

ADSL and ADSL2+ are the most popular and widespread forms of broadband, with line speeds peaking at 8Mbit/s and 20Mbit/s respectively (although this depends on factors like your distance from the telephone exchange, the number of other services being used on that exchange and the quality of the wiring). As these operate through your local telephone exchange, you'll need an active phone service to use them, which adds to your monthly cost.

Of course, this isn't a hindrance if you need a home phone anyway, and almost all ADSL2+ providers offer a discount off the monthly broadband cost if you bundle it with a telephone service from the same provider. Some plans aren't even available unless you bundle it with a phone service. The types of phone plans available vary between ISPs – some offer a minimal line rental service with calls charged on a per-unit basis, while others offer full phone plans with perks like unlimited local and national calls – ideal for families.

You can forgo line rental altogether without going down the cable route by opting for Naked DSL. This is a special form of ADSL that doesn't require an active phone service – the catch is that you'll need a phone service for the initial ADSL installation, after which point you can cancel the service. Like traditional ADSL and ADSL2+, you'll need to check whether Naked DSL is offered at your local telephone exchange. Most of the major ISPs offer it, but usually on a limited subset of broadband plans compared to traditional ADSL2+. You can usually pair a Naked DSL plan with a VoIP service from the same provider to save on line rental charges, and you'll also get cheaper call rates than you'd get on a standard phone line.

HARDCORE DOWNLOADERS

You know who you are. You've got all of the main torrent sites bookmarked in your web browser. You've constantly got a steady queue of high-definition movies, TV shows and games lined up in your download manager app, strategically scheduled for downloading during your broadband plan's off-peak hours. You have to buy a new external hard drive every other month to store all of your downloads in. And your connection is constantly getting shaped to a slower speed towards the end of the month because you've used up all your data allowance.

The good news is that unlimited ADSL2+ plans that don't cost a mint are well and truly a reality. And we're not talking about the wannabe 'unlimited' plans that throttle your connection back to a slower speed once you reach a certain data limit (we're looking at you, Optus), either. In the last six months, AAPT and TPG have both introduced true unlimited plans that let you upload and download files to your heart's content. Naturally, there are fair use policies in place that give the ISPs the right to cancel your account for abuse, but users on the Whirlpool forum have reported downloading over a terabyte of data every month on these plans without penalty.

The main sticking point for these plans is that the ISPs currently providing them require you to sign up for a 12-, 18- or 24-month contract, with early termination fees leave.



- SELECTED FREE IPTV CHANNELS
- $1 LINE RENTAL
- STATIC IP ADDRESS

9/10

$75 MONTHLY

TPG ADSL2+ Unlimited 24 x 7

@ www.tpg.com.au

✔ Cheapest unlimited option; cheap line rental; static IP address.

✖ Limited to Sydney only; have to commit to 12- or 18-month contract.

Considered to be the reigning value leader when it comes to high-volume broadband plans, it's no surprise that TPG rules the roost with the cheapest unlimited broadband plan on the market. At this stage, the plan is available to Sydney only, but TPG plans to expand this to other cities as it broadens its network coverage. You'll have to commit to a 12- or 18-month contract, with the latter option also entailing a $59.95 setup fee. The plan comes with a static IP address and free access to some IPTV channels (mainly ethnic channels like Greek TV and France 24), and you can pair it with an optional line rental for an extra dollar a month.



- 24-MONTH CONTRACT
- LINE RENTAL INCLUDED
- $50 MUSIC VOUCHER EVERY MONTH

8/10

$99.95 MONTHLY

AAPT Anytime Value +

@ www.aapt.com.au

✔ Unlimited music streaming; free Wi-Fi modem; wide coverage.

✖ Two-year contract; expensive cancellation fee.

AAPT has packaged up a unique unlimited plan that appeals to music lovers and hardcore downloaders. As well as true unlimited data around the clock, this plan includes unlimited streaming from AAPT's music store (around a million tracks), $50 worth of music downloads a month (around 30 tracks), line rental and a bonus Wi-Fi modem – not a bad haul for the hundred-dollar-a-month cover charge, especially since it's available to a much wider coverage of users than TPG's unlimited plan. Of course, AAPT doesn't give this away easily – this plan is a 24-month contract only, with a sizeable cancellation fee.



- 1,500/256KBIT/S FIXED SPEED
- HELP DESK SUPPORT 7 DAYS A WEEK
- FIVE EMAIL ACCOUNTS

7/10

$159.95 MONTHLY

Internode Home-Standard

@ http://internode.on.net

✔ Available monthly basis; cheap cancellation fees; nation-wide.

✖ Expensive; slower ADSL connection.

From the outset, Internode's unlimited plan has two strikes: it's ADSL only (with a fixed speed of 1,500Kbit/s for downloads and 256Kbit/s for uploads), and it's considerably more expensive than faster ADSL2+ unlimited plans. But it's also got advantages that could make it a more appealing option. First, it's available on a month-to-month basis, so if you're hesitant about locking yourself into a contract, Internode's plan is a safer bet. Even if you sign up for a 24-month contract (with cheaper setup and establishment fees), the early cancellation fee is a paltry $120 for the first 12 months and $65 in the second 12 months.

FreeNet Antennas

20km* Access Point

Imagine the performance in your house!



- 5 operating modes
- 60/90/130/200 mW versions available

Just $89



* With external antenna

Dealer inquiries welcome

www.freenet-antennas.com/apc

FREQUENT WEB USERS

You may not fit the bill of a hardcore download demon, but if you're still hitting the roof of your monthly data limit on a fairly regular basis and you count online gaming, streaming high-definition videos, downloading movies and music and/or listening to internet radio as a regular component of your leisure activities, this is the category for you. You'll also fall into this category if you share your internet connection with other household members – mainly sharehouses and flats, as we deal with family users in a separate section.

For you, an unlimited plan is probably over-kill, although it's worth pointing out that there isn't a massive price difference between the unlimited plans and standard plans with a large data allowance. The main things to note are that the data allowance is typically split between peak and off-peak usage, and that these periods of time differ between plans and ISPs. This won't make much of a difference for downloads, as you can schedule them to start and finish during your off-peak hours to make the most of your data allowance, but it will obviously impact things like online gaming and streaming audio and video – none of which you'll be doing while you're asleep or away from the computer.

The other things to check are whether uploads are included in your monthly allowance, whether you're charged an excess usage fee or if your connection speed is throttled back once you reach your limit, and the speed that it's shaped back to if the latter applies.



iPrimus ADSL2+ Big Kahuna

@ www.iprimus.com.au

✔ Long off-peak period; data top-up option available.

✖ Shaped to 128Kbit/s, only available with $29.95 iPrimus phone plan.

iPrimus must've been in a giving mood when it came up with its Big Kahuna plan. It comes with a solid 300GB of data – 80GB to use during peak hours and the rest off it off-peak, with uploads included in the total, and the option of a 12- or 24-month contract. The off-peak hours are generous – while most plans limit this to a 5-6 hour window in the early hours of the morning, this plan gives you 12 hours – from 12am to 12pm. Connection speeds are shaped to a turtle-like 128Kbit/s if you exceed the limit, but you've also got the option of topping up your data allowance instead to hold onto your ADSL2+ speeds, starting at $5.95 for 1GB.



TPG Super Fast 500GB

@ www.tpg.com.au

✔ Large data allowance; fast shaping speeds; affordable.

✖ Short off-peak period; uploads included in allowance.

For all but the most determined of downloaders, a 500GB data limit is as good as unlimited, only you're not paying as much per month. At any rate, this plan offers a good stepping stone to TPG's true unlimited plan (if it's in your area) – you can sign up and track your monthly usage and, if you burn through the 500GB easily, you can upgrade to the more expensive unlimited plan at no charge. The peak period is 8.30am-3.30am, so you've only got five hours to use 350GB of your allowance. If you use up all your data, connection speeds are shaped back to a reasonable 1Mbit/s for downloads and uploads.



TPG Super Fast Premium

@ www.tpg.com.au

✔ Shaped connection still fast; uploads not included in data allowance.

✖ Relatively small data allowance for full-speed connection; pricey.

TPG's Super Fast Premium plan seems an odd choice at first glance. At $89.95, it's thirty dollars more expensive than the TPG Super Fast plan that we also reviewed, despite having only a third of the data on offer at 150GB. But a closer inspection reveals all: there are no peak and off-peak periods to use that data, uploads aren't included, and, most importantly, downloads speeds are shaped to a still-speedy 4Mbit/s once you go over the limit. Depending on the line speeds that you can get at your location, you may not even notice a speed reduction if you go past 150GB, effectively making it an unlimited plan.

FAMILIES

If a working home phone is one of those non-negotiables like electricity and water, consider yourself in the Families category. Bundling a phone and broadband plan together from the same provider works out cheaper than getting the two services separately, as the ISP will either give you money off your broadband charge (typically $10 off a month), or offer a plan that includes both services and perks like free local and national calls and discounted international calls.

Assuming you can get it in your area, a Naked DSL plan and a VoIP service for phone calls is an option worth considering. This can work out cheaper than bundling a traditional phone and broadband service together as most ISPs offer VoIP plans with no monthly line rental charges and cheaper call rates. The only drawback is that your phone service gets cut off if there's a power shortage, although it's a shortcoming that you can work around with an uninterruptible power supply – or having a mobile phone as backup.

In a family home environment, it's a safe bet that there'll be more than one person using the internet, with users scattered throughout different sections of the house. The cheapest and easiest way to get everyone connected to the broadband service is by using a Wi-Fi network, so it's worth checking whether the ISP offers a Wi-Fi modem for free or as an optional extra. Also make sure that there's enough data to go around – while 20GB may sound like plenty for checking email and web browsing, this can go south in a hurry if all of the kids are watching YouTube videos, downloading music and playing online games.



- SHAPED TO 256KBIT/S AFTER 50GB
- FREE DELIVERY & CONNECTION FEE
- 24-MONTH CONTRACT

7/10

$129 MONTHLY

Optus 'yes' Fusion $129 Unlimited

@ www.optus.com.au

✔ Unlimited calls to landlines and mobiles; free Wi-Fi modem.

✖ Long commitment; broadband isn't really unlimited; pricey.

If you're the sort of parent that has to physically wrench the landline from your kids' hands, this plan – the flagship of Optus' unlimited Fusion offerings – is ideal. We're annoyed that Optus advertises it as having 'unlimited' broadband when what you really get is 50GB of uploads and downloads at ADSL2+ speed and the rest at 256Kbit/s. But the unlimited free calls offer is legitimate: local, national and mobile calls are all unlimited, and the line rental charge is included within the monthly price. A Home Wi-Fi modem is also included for free, which takes the sting out of the necessary two-year commitment somewhat.



- UNLIMITED CALLS
- CHEAP INTERNATIONAL CALLS
- MONTHLY CONTRACT OPTION

8/10

$69.99 MONTHLY

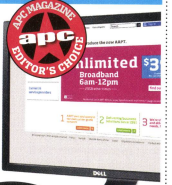
iiNet Naked Home 3

@ www.iinet.com.au

✔ Free local and national calls; monthly contract option.

✖ Slow shaped speed; long peak period.

A good example of the cost-savings you can get from choosing Naked DSL can be found in this plan. Not only do you forgo the monthly line rental charge but you get unlimited free local and national calls, and international calls as low as 5c per minute. On the broadband side, it comes with 60GB of uploads and downloads that are split 50-50 between the peak and off- peak periods (peak is 8am-2am), after which is it's shaped to 128Kbit/s downloads. Downoads from the iiNet Freezone, which includes iTunes, Xbox Live Content, internet radio stations and ABC iView are excluded from your allowance.



- PEAK PERIOD 8AM-8PM
- UPLOADS NOT INCLUDED
- FREE WI-FI MODEM

9/10

$99.95 MONTHLY

AAPT Anytime Unlimited +

@ www.aapt.com.au

✔ Unlimited downloads during off-peak; free local and national calls.

✖ Shaped to 256Kbit/s for both peak and off-peak; 24-month contract.

AAPT hasn't designated this plan for families specifically, but features like bundled line rental, free Wi-Fi modem, unlimited local and national calls, and unlimited downloads between 8pm and 8am (perfect for internet use after dinner) make it a great fit for web-savvy households. During peak hours, you get 20GB of downloads, which you'll need to keep a careful eye on; step over the 20GB limit, and your connection speed will be shaped to 256Kbit/s – even during the off-peak periods. The minimum contract period is 24 months, with a pro-rated early termination fee of up to $300 to discourage you from jumping ship early.

BARGAIN HUNTERS

One of the key developments over the past year is the dramatic price falls of ADSL2+ broadband. You no longer need to spend big to get a decent data allowance – less than fifty dollars a month will get you well over 100GB of data if you shop wisely, making things like 1080p high-definition movie rentals, around-the-clock internet radio streaming and replacing your home phone with a cheaper VoIP service an affordable option for any budget.

Of course, this depends on the ADSL services that you have available in your area – if you're outside the metropolitan areas of each state, you might have access to Telstra's pricier broadband plans only, assuming your local exchange has ADSL or ADSL2+ enabled at all.

If your local telephone exchange supports it, your cheapest monthly option for ADSL2+ is Naked DSL. These plans are typically ten dollars more expensive than their standard ADSL2+ equivalents, but you still end up saving money on the line rental charge. Even if you need a home phone, VoIP works out cheaper as you usually don't have to pay line rental charges and the call rates are lower than a landline.

If you're dead-set on a proper phone line, you can still save money by moving your current phone service to your ISP. The line rental charge probably won't be any cheaper than you're currently paying, but most ISPs give you a discount (typically around $10 off a month) if you bundle a broadband plan with one of their phone plans.



TPG Super Fast 180GB

@ www.tpg.com.au

✔ Excellent value; fast shaping speeds; available as Naked DSL.

✖ No month-to-month option; uploads included in quota; short off-peak.

TPG's Super Fast 180GB plan offers the most data per dollar in the under $50 category. Essentially, it's a cheaper option of the TPG Super Fast 500GB plan that we covered earlier, with uploads and downloads counted, a 50-50 split of the data allowance between peak (8am-2am) and off-peak periods, and shaping to 1Mbit/s. This plan is also available in Naked DSL, which adds an extra $10 a month. Otherwise, you can bundle it with a TPG Home Phone – while this doesn't take any money off the broadband plan, the $1 line rental and minimum monthly spend of $10 means you're saving at least ten dollars on your old line rental.

iPrimus Kahuna Plus

@ www.iprimus.com.au

✔ Can top-up data if you reach your limit; reasonably good value.

✖ Shaped to dialup speeds; have to bundle it with $29.95 phone plan.

If TPG isn't available at your local exchange, you'll probably have better luck with iPrimus. But its Kahuna Plus plan is a pale imitation of TPG's Super Fast plan. Not only does it offer 50GB less data at 130GB (half of which can only be used during peak – 10am-2am), but the connection is shaped back to dialup speeds if you exceed the monthly allowance. To get around this, iPrimus lets you purchase data top-ups for a one-off increase to your data limit, but don't expect the same rates that you got for the original plan – another $50 worth of top-ups only gets you an extra 20GB of uploads and downloads.

AAPT LiveNet 20 – Unlimited

@ www.aapt.com.au

✔ Affordable; unlimited downloads between 6am and 12pm.

✖ Small peak-hour data allowance; uploads included.

A little discipline goes a long way. If you can manage to save all of your heavy-duty uploads and downloads to this plan's off-peak hours of between 6am-12pm, the 20GB allowance for peak periods should be enough to tide you over for web browsing and email. You can then pat yourself firmly on the back for getting such a great deal on broadband while still being able to download whatever you want. But you'll need to keep a watchful eye on your peak-hour usage – if you end up going over 20GB, your connection speed will be slowed down to 256Kbit/s for both peak and off-peak periods.

LIGHT USERS

Suggesting that you can get by on anything less than 50GB a month for broadband may seem heretical to those that live and breathe the internet, but if you're only using it for checking email, reading news online and looking up your Faebook page, a 10GB plan will be more than enough, with extra wiggle room for the odd download, YouTube stream and updates to your operating system and software.

These types of plans are also recommended if you're choosing a broadband plan for the first time and aren't sure how much data you need. The smart way to go would be to choose one of the cheaper plans, monitor your usage for the month, and upgrade to a plan with more data if you need to. Even though high-volume plans are now cheaper than ever, you still don't want to be paying for data that you never use. Most ISPs won't charge you to move up to a more expensive plan (although this is worth checking in the fine print), but there's usually a fee involved if you want to switch to something cheaper.

For simple web browsing, and even streaming YouTube videos in standard definition, you won't really notice a speed difference between ADSL and ADSL2+. That said, there aren't any real cost savings to be had by opting for the slower technology. In fact, we found the opposite to be true, with most ADSL plans having a higher monthly charge than the equivalent ADSL2+ plans from the same provider.



- BIGPOND UNMETERED
- 12- OR 24-MONTH CONTRACT
- 1,500/256KBIT/S ADSL

6/10

$59.95 MONTHLY

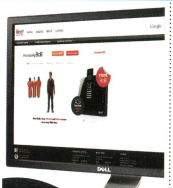
BigPond Liberty 12GB

@ www.bigpond.com

✔ Nation-wide; lots of unmetered sites and services; no peak or off-peak.

✖ Expensive; excess usage charges; slower ADSL speeds.

If you're looking for a bargain, you won't find it here. Telstra charges more per gigabyte than any other ISP, but since it's available at more exchanges, it's a highway robbery it can get away with. The Liberty 12GB plan is ADSL and has downloads speeds of 1,500Kbit/s. Uploads are included in the monthly quota, and excess usage is charged at 15c a megabyte. If you combine this plan with a Telstra HomeLine and another Telstra product, you can shave $20 off the monthly charge. To maximise your data, you can also take advantage of BigPond Unmetered sites that don't count towards your monthly limit.



- SHAPING TO 128KBIT/S
- PEAK PERIOD 9AM-2AM
- IINET FREEZONE

7/10

$59.99 MONTHLY

iiNet Home 1

@ www.iinet.net.au

✔ Free unmetered access to iinet Freezone; flexible contract options.

✖ Only available if bundled; data split between peak and off-peak.

iiNet's ADSL2+ Home 1 plan is typical of what's available if you're only after 10GB of data – these plans are fewer than you may expect. As with other ISPs that operate at this end of the market, the plan is only available if you bundle it with an iiNet phone, bringing your monthly spend up to $59.90. Still, iiNet does sweeten the deal somewhat with the iiNet Freezone, which gives you unmetered access to online radio, ABC iView, iTunes downloads, and a range of other sites and services. The plan is also available on a monthly basis, so you can move to another plan or ISP if you outgrow this one without any financial penalties.



- FREE ACCESS TO OVER 225 GAME SERVERS
- UPLOADS INCLUDED IN MONTHLY DATA ALLOWANCE
- FLEXIBLE CONTRACT OPTIONS

8/10

$29.95 MONTHLY

Netspace ADSL2+ Super 20

@ www.netspace.com.au

✔ Free online gaming via Gamespace; no contract; no peak/off-peak.

✖ Shaped to dialup speeds; have to bundle with phone service.

Netspace has a great deal for entry-level users. With 20GB of uploads and downloads included (and no peak/off-peak periods), there's twice as much data on offer for $30 a month – although you'll still have to bundle this plan with a Netspace phone service for $29.95, and your connection is shaped back to dialup speeds if you go over your monthly limit. If you're into online gaming, you can maximise your monthly data by taking advantage of the free Gamespace service, which features over 225 game servers with the latest multiplayer games like Left 4 Dead 2, Gears of War and Call of Duty 4.

GIGABYTE™



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GIGABYTE SUPER OVERCLOCK SERIES

ULTRA DURABLE VGA BRINGS ULTRA COOL, ULTRA STABLE OC PERFORMANCE TO GIGABYTE GEFORCE GTX 470 GRAPHICS CARD

FERMI: NEXT-GENERATION GAMING IS HERE

As one of the first consumer GPU to be based on NVIDIA's revolutionary Fermi architecture, there is no doubt that the GV-N470SO-13I means business. Meticulously engineered from the ground up to deliver phenomenal performance and stunning cinematic visuals, the GV-N470SO-13I comes Super OC and 1280MB worth of GDDR5 memory – providing additional overclocking headroom and stability with the brandished authority of Ultra Durable VGA

DX11 DONE RIGHT! ONLY NVIDIA GTX400 GPUS DELIVER THE TESSELATION PERFORMANCE FOR DIRECX11

As World's fastest gaming GPU delivers unparalleled 3D realism and immersion, NVIDIA GTX 400 GPU delivers incredible gaming performance at maximum resolution and quality settings. Revolutionary DirectX 11 technology and NVIDIA® CUDA™ architecture bring games closer than ever to cinema-quality effects and visuals. Moreover, NVIDIA® PhysX® technology brings games to life with dynamic, interactive environments. New NVIDIA® 3D Vision™ Surround technology expands your gaming real estate across three monitors in full stereoscopic 3D for a truly immersive gaming

GIGABYTE 470SOC FEATURES

- GIGABYTE GPU Gauntlet™ Sorting Technology
 - Plus "Proadlizer® Quintuple"- Film Capacitor
 - More Than 20,000uF on Board
- GIGABYTE Ultra Durable VGA+ High Quality Components
- GIGABYTE Anti-turbulence Inclined Triple Fan
- GIGABYTE OC Guru – Graphic Card Smart Tuner
- Dedicated Voltage Read Point Design



Coupled with Gigabyte Ultra Durable VGA+ boards, users can rest assured that the Super Overclock Series graphic cards will not let them down as they step onto the digital battleground.

• Proadlizer® Quintuple: Up to 5000uF
Extremely high capacitance and low ESL/ESR

• 2oz Copper PCB
2oz copper PCB board doubles the inner layer of PCB board and provides unrivaled performance compared with traditional 1oz PCB board.

• Tier 1 Samsung and Hynix Memory
Ultra Durable VGA+ promises to use 1st tier Samsung/Hynix memory, 100% fully tested.

• Japanese Solid Capacity
Solid capacitors contain a solid organic polymer while electrolytic capacitors use a common liquid electrolyte. Our cards use Japanese solid capacitors made by leading Japanese manufactures and offer better electronic conductivity.

• Ferrite Core \ Metal Chokes
Ferrite core chokes are comprised of an iron-oxide compound that holds energy much longer than common iron-core chokes at high frequency. They are able to store energy longer and prevent rapid energy loss at high frequency.

• Low RDS (on) MOSFET
Lower RDS (on) MOSFETs are specially designed to produce lower switching resistance for faster electric current charging and discharging.



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• EXPERT POWER SWITCHING



ULTRA DURABLE VGA – GAMING ENTHUSIAST'S BEST FRIEND

Understanding that performance matters to enthusiast and hardcore PC gamers alike, the GV-N470SO-13I incorporates GIGABYTE's very own Ultra Durable VGA (UDV) technology to deliver on three key objectives:

- lower temperatures
- reduce power consumption
- increase overclocking performance.



Previous Ultra Durable Series graphics cards have shown great overclocking potential with the adoption of Lower RDS (on) MOSFETs, Ferrite Core Chokes and Lower ESR Solid Capacitors. Not one to shy away from quality components, Ultra Durable VGA features a 2 oz. copper PCB design that transfers the heat uniformly to the entire board, well away from critical areas for up to 10% reduction in the overall GPU temperature.

The inclusion of Tier 1 GDDR5 memory from either Samsung or Hynix bodes well for optimum overclocking performance (by up to 30%), while the switch to Japanese Solid Capacitors ensures rock-solid system stability and durability.
Furthermore, the Lower RDS (on) MOSFETs can expertly reduce power switching loss by as much as 30%, leaving the Ferrite Core Chokes to regulate current flow and store energy longer at high frequency.

UNPRECEDENTED DIRECTX 11 VISUALS – AMAZING 3D REALISM

With such phenomenal qualities, there's no denying that Ultra Durable VGA delivers tremendous overclocking potential with the GV-N470SO-13I. Taking DirectX 11 gaming to the next level, the GV-N470SO-13I leverages Shader Model 5.0 technology, NVIDIA's CUDA GPGPU architecture and PolyMorph Engine to deliver GPU -accelerated tessellation and high-quality 32x anti-aliasing without compromising on performance and image quality.
And with exclusive NVIDIA technologies like PhysX, CUDA, SLI and 3D Vision Surround technology, the ultimate gaming experience is yours for the taking!



At a Glance
NVIDIA GeForce GTX 470 GPU
448 Stream Processors
1280MB GDDR5 Memory
320-bit Memory Interface
Shader Model 5.0
Microsoft DirectX 11
OpenGL 3.2
GIGABYTE Ultra Durable VGA
PCI Express 2.0 x16 Graphics Bus
2x Dual Link DVI-I, 1x Mini HDMI (Mini HDMI to HDMI cable provided)

IPHONE NAVIGATION

If you've got an iPhone you can say good riddance to getting lost. **Jenneth Orantia** takes a look at your options.

If you're after a navigation device and own an iPhone already, there's a lot to be said for skipping a dedicated sat-nav and buying an iPhone turn-by-turn navigation app instead. It's cheaper, for a start, and since it's in your iPhone you can use it for finding places on foot too.

Navigation on smartphones has come a long way. Five years ago, getting a GPS signal on a smartphone app would have taken anywhere from five to ten minutes; rerouting after you missed a turn would have you three blocks down before it would offer an alternative route; and using the complex menu systems was not a feat to be attempted while driving.

It wasn't until the iPhone came along that smartphone navigation apps came into their own. It helped that the iPhone's GPS chip and processor was a lot better than what was available in previous smartphones, and the iPhone's roomy 3.5in capacitive display and large user base made it a natural target for navigation veterans like TomTom, Navigon, CoPilot and Sygic.

So what can you expect in an iPhone navigation app? If you're coming from a dedicated sat-nav, the experience isn't much different. Unlike Google Maps, which downloads maps over the air as you need them, these apps store maps locally, so you can use the navigation even when you don't have a signal. These programs are bigger as a result, and you're looking at between 230MB to 552MB – something you'll need to take into account when downloading and installing the program onto your iPhone.

The features on offer differ, but you can generally expect spoken street names (although this is an optional extra in CoPilot), a points-of-interest database, speed camera alerts, the ability to navigate to contacts in your address book, and iPod controls within the app.

There are also unique features to be found in each program: TomTom is the only one that offers Google Local Search, which means you can look up points of interest in Google's database; Mobile Maps offers real-time updates of speed traps and incidents; CoPilot lets you update your Facebook status with your location and the music you're listening to; and Navigon features a 'Reality View Pro' display that shows signposts and motorway interchanges in 3D.

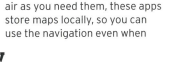
Each app has its own set of maps, so accuracy is largely dependent on how up to date these are – we didn't run into errors when testing the apps around Sydney.

If you want to position your iPhone like a proper navigation device, you'll also need to factor in the cost of a docking cradle and car charger.

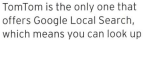
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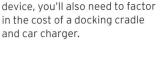
CoPilot Live Australia & New Zealand



Mobile Maps Australia & New Zealand



Navigon MobileNavigator



TomTom Australia

What do I look for?

In an iPhone navigation app. . .

LOCAL STORAGE

Australia-wide maps should be stored locally on the iPhone. Otherwise, you'll have to pay for data usage every time you look up a location.

BUILT-IN CONTROLS

If your iPhone doubles as an in-car music player, you'll want to make sure the navigation app has built-in iPod controls for navigating through tracks without leaving the mapping interface.

LANE GUIDANCE

Lane guidance is a handy feature when you're travelling on major roads, large freeways and motorways, as it ensures you're in the right lane leading up to your next turn.



SPOKEN DIRECTIONS

Spoken turn-by-turn directions is another essential element that separates the simple Google Maps-style programs from the full-fledged navigation apps. This lets you concentrate on driving rather than having to keep checking your iPhone screen for the next turn.

HAZARD ALERTS

Red light and speed camera alerts are one of the side-perks of an iPhone navigation app, as they prevent you getting caught out by those sneaky hidden cameras. The app will pay for itself twice over if it saves you from just one speeding fine!



CoPilot Live Aust & New Zealand

@ www.travroute.com.au

✔ Lots of eye candy; iPod music control; predictive text for address entry.

✖ Have to pay for spoken street names; serious navigation bug.

Travroute has a long history of developing navigation software for PDAs and smartphones, and this heritage shows in the latest version of its CoPilot Live software for the iPhone. The user interface is probably the flashiest of all the apps we reviewed, with bright and bold colours, stylish menu icons and a slick, visually appealing mapping screen.

That's the good news. The bad news is that this is also its weakness. Since it has the same interface as the CoPilot apps on other platforms, it doesn't use iPhone user conventions, so rather than swipe through menu screens as you would in other iPhone apps, you have to tap on arrow buttons. Similarly, zooming in and out of the maps is done using the plus and minus icons at the top of the screen rather than the standard iPhone pinching gestures.

CoPilot Live joins Mobile Maps as the cheapest turn-by-turn navigation apps in this roundup, but if you want spoken street names, you'll have to fork out an extra $5.99. Otherwise, you're stuck with the annoying Jessica, who, while Australian, has a jarring twang to her voice that we've never actually heard on any real-life Australians. You're also left blind when it comes to the name of the street you're turning into, the maps don't display this.

We encountered a serious bug where it would sometimes give a voice direction and navigation arrow to go in one direction but have the highlighted route on the map pointing in the opposite direction – the highlighted route was the correct version, so it's something to be aware of when relying on voice guidance only. The inclusion of New Zealand maps adds to CoPilot's value for money – we just wish that it didn't include Kiwi cities in the predictive text when you're entering a city name.

CoPilot has a few gimmicky features like Facebook updates and location sharing, but we'd rather it replaced these with more useful features like tunnel tracking and lane assistance.



APC MAGAZINE EDITOR'S CHOICE RECOMMENDED

Mobile Maps Aust & New Zealand

@ www.sygic.com

✔ Intuitive user interface; excellent lane assistance and signpost display; cheap.

✖ No iPod control; doesn't use the iPhone keyboard; doesn't track in tunnels.

Out of all the navigation providers in this roundup, Sygic is the least well-known. After testing Mobile Maps around the streets of Sydney, however, it's not something we'll hold against them. Mobile Maps has a gorgeous and intuitive user interface that makes it a snap to look up addresses and navigate to destinations.

Routing takes less than a second, and the mapping screen is beautifully designed, with the time of arrival, distance to destination, distance till the next turn, and your current speed displayed at the bottom of the screen. Street names are easy to read, and the road that you're turning into next is helpfully displayed in bigger letters on the map.

Real-time traffic has its own icon in the menu system, but it's just a tease – you'll have to wait for the next update before its active. Otherwise, Mobile Maps has a good selection of features like speed camera warnings, speed limit warnings, signposts to help you get your bearings and a lane assistant indicator that tells you which lane you need to be in at busy turns. Mobile Maps has the best implementation of the latter two features – while the other apps had spotty support for signposts and lane indications, Mobile Maps displayed these on a regular basis.

Some features are hidden away in the settings that we'd prefer as an option up-front, such as avoiding toll roads and changing the route type. Mobile Maps works with the policetraps.com database for reporting police traps and traffic incidents; if you activate this feature, you can report traps as well as receive real-time updates for traps that are in your route.

Mobile Maps doesn't support tracking in tunnels, so navigation simply stops until you get a signal again. Oddly, it doesn't use the standard iPhone keyboard, and the layout of the built-in one is harder to use. It's the only app that doesn't support iPod control, so you'll have to exit to the iPhone's main menu to change tracks.



Navigon MobileNavigator

@ www.navigon.com

✔ Very iPhone-like interface; reality view feature; can choose different routes.

✖ Only one text-to-speech voice available; mapping screen too busy.

Until Apple comes out with its own turn-by-turn navigation software, the closest you'll get is Navigon Mobile Navigator. This app adheres to iPhone conventions like the tabs along the bottom of the screen (styled to look exactly like the ones in the Phone app), arrows for navigating through nested menus, and settings screens that look just like the iPhone's Settings applet. It even uses the iPod interface for changing tracks from within the app – tapping on the iPod icon in the bottom right-hand corner causes the map to flip up (not unlike Google Maps) and reveal the iPod playback controls and album art.

MobileNavigator offers an excellent 'Reality View Pro' feature that shows signposts, motorway interchanges and exits in 3D, as well as lane assistance – a feature that made navigation a highly enjoyable experience. We were especially impressed with tunnel tracking; as soon as you enter a tunnel, MobileNavigator switches to a 3D tunnel graphic and keeps tracking so you know which exit to take. By contrast, the general mapping screen could do with a rework – we found the different colours on the map competed for attention, and the layout was too busy to make it easy to follow.

Another unique feature to MobileNavigator is MyRoute. This gives you up to three different route options for getting to your destination and is displayed on the summary screen after you enter your destination. Distance and ETA are given for each route, and all of them are colour-coded and displayed on a map to make it easier for you to decide which route you'd like to use.

Spoken street names are available out of the box, and speed cameras come as standard (although these are turned off by default). There are more than a few 'bonus' features as well; you can post your destination to Facebook and Twitter, share your current location with contacts via email, and purchase an optional Panorama View 3D mode for $14.99.



TomTom Australia

@ www.tomtom.com

✔ Can look up POI in Google; intuitive menu system; tracks in tunnels.

✖ Expensive; limited iPod control.

TomTom Australia is the priciest navigation app by a comfortable margin, so we were keen to see whether the extra markup was justified compared to the other apps we tested. It does offer a couple of extra features like Google Local Search and IQ Routes (a feature that uses the experience of other TomTom drivers to calculate the fastest route), but we're not convinced that it justifies the additional $30-$40 that you have to pay over the other apps.

Owners of TomTom's dedicated sat-navs will be instantly familiar with the mapping screen, which uses the same graphics, colours and layout, but street names are a bit too small for our liking. The main menu has been revamped for easier use on the iPhone, using nested lists rather than icons – this is a big improvement over TomTom's standard sat-nav interface, which has always had a few too many screens' worth of options to navigate through.

Navigation was a good experience overall: routing and rerouting is quick, it gives you an option to avoid toll roads from the outset, and it continues tracking in tunnels. TomTom gives you options to avoid particular roads along your route and add an extra destination along the way from the route options dialog on the summary screen. Fourteen English voices are included (three of which have text-to-speech), but rather than incorporate spoken street names into voice directions naturally, (ie. "Turn right onto Bronte Road"), it would tack them onto the end of the sentence like an afterthought (ie. "Turn right, Bronte Road").

We'd be more enamoured about the Google Local Search feature – which lets you look up nearby businesses by name over the internet – if the iPhone didn't offer this facility already via its own web browser and Google Maps app. iPod control is also limited to pause, rewind and skip – you can't add more music to the playlist or see the names of tracks.

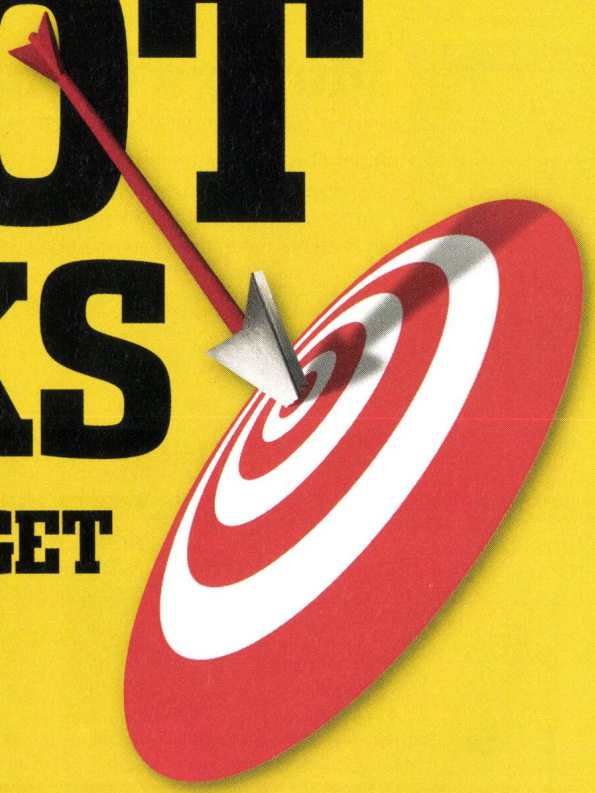
HOUSE VERSUS UNIT: PAUL CLITHEROE'S VERDICT

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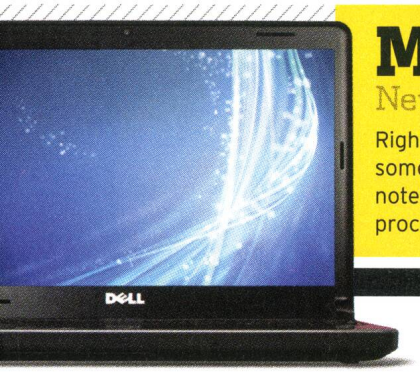
Best tech

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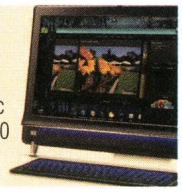
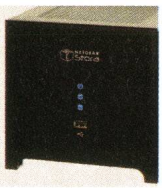
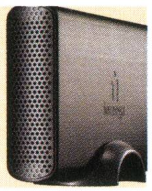
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Movers & shakers

New budget notebooks

Right now you don't need to spend a lot to get some seriously good performance in a new notebook computer. The Core i3 and Core i5 processors have taken the notebook market by storm, with Core i3 models hitting the sub $800 price point hard. AMD aren't hiding though, there's some seriously good deals and new models landing on shelves too.

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
GENERAL PC	**Scorptec Stinger** NEW Not a cheap desktop but it absolutely screams. Dual SSDs, high end water cooled CPU, Blu-ray and SLI graphics. Tackles anything.  **$5,499 > Scorptec > www.scorptec.com.au**	**HP Pavilion PC-090a** A smashing all rounder for the discerning user. This PC has a Core i7 860 and 8 gig of RAM. That's plenty of power for nearly everyone.  **$2,699 > HP > www.hp.com.au**	**iBuyPower Terminator X58** A superbly built and specced gaming system. Core i7 920 overclocked, two Radeon 5970 cards: no game can stand up to the Terminator.  **$6,649 > iBuyPower > www.ibuypower.com.au**
PANEL PC	**ASUS EeeTOP PC ET2203T** For a panel PC, ASUS have hit the nail on the head. Including Blu-ray, 1080 HD screen, SRS sound and touch optimised software.  **$1,699 > ASUS > www.asus.com.au**	**HP TouchSmart 300 & 600** HP' Touchsmart all-in-one, touchscreen PCs run Win 7 and are the closest thing to the iMac in the PC World. The 300 is the affordable one.  **$1,699 > HP > www.hp.com.au**	**Apple iMac 27in** A stunning computer gets even better as Apple release the 27in iMac, complete with LED 2,560 x 1,440 display, as well as Core i5 CPU.  **$2,599 > Apple > www.apple.com.au**
NAS HOME	**Netgear Stora** This NAS doesn't have the roomiest capacity, just holding two 3.5in drives, but its remote access functions and usability are second to none.  **$399 > Netgear > www.netgear.com.au**	**Iomega Home Media Network** When nanna asks you what NAS she should buy, point her to this 1TB NAS designed to store and share images and multimedia across DLNA devices.  **$429 > Iomega > www.iomega.com.au**	**Thecus N2200 4TB** This little box has all of the right features for a great home NAS. 4TB of storage, a tiny footprint, DNLA server, iTunes and BitTorrent as well.  **$649 > Thecus > www.thecus.com**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
EXTERNAL DRIVE	**Iosafe Solo 500GB** You want bomb-proof? Here it is. This external drive can survive flood and fire, and with a free disk recovery within a year after a disaster, you're safe.  **$275 > Iosafe > www.iosafe.com.au**	**Toshiba 640GB USB 2.0** This 640GB USB 2.0 portable external hard drives comes with system backup (Windows only), password protection for added security and enhanced software features.  **$199 (640GB) > Toshiba > toshiba.com.au**	**WD MyBook 3.0** This 1TB external hard disk drive sports the lastest 3.0 speeds. It even comes with a USB 3.0 PCIE card in the box. It's triple the speed of last generations drives too.  **$249 (1TB) > Western Digital > www.wd.com**
NETBOOK	**HP Mini by Studio Tord Boontje** Though the internals are quite run of the mill, you'll stand out with the unique layered image finish on this stylish unit.  **$799 > HP > www.hp.com.au**	**Toshiba NB200** It's not the best looking netbook out there, but with a set of full size keys, light weight and 1,024 x 600 and outstanding battery life, you wont be left wanting.  **$500 > Toshiba > www.toshiba.com.au**	**HP Mini 210** Even though its has a low pricetag, the performance and design of this model mean its right at the top of the list. Six hours battery isn't bad either!  **$449 > HP > www.hp.com.au**
NOTEBOOK ALL-ROUNDER	**New MacBook Pro 15in** An Apple fan will appreciate this more than a PC switcher, but the new MacBooks with Core i7 are the best yet. A good battery life really lifts this model.  **From $2,199 > Apple > www.apple.com.au**	**Compaq Presario CQ41-226TX** $1,200 buys you a lot of notebook these days! This Compaq model includes a new Core i5 chip, discrete graphics and a high-quality keyboard and screen.  **$1,199 > HP > www.hp.com.au**	**Dell Inspiron 15R** Budget notebooks can have rollicking performance too. This beast rocks a Core i5 processor, and ATI Mobility Radeon 5470 for snappy performance.  **$1,049 > Dell > www.dell.com.au**
DESKTOP REPLACEMENT	**ASUS G73Jh** Holy moly! With a Core i7 CPU, 8GB of RAM and a Radeon 5870 graphics chip, you'd be forgiven for thinking this was a gaming desktop PC.  **$2,699 > ASUS > www.asus.com.au**	**Dell Studio XPS16** With one of the best screens we've seen on a notebook, as much customisation as you want and a great design, it's a winner.  **$1,789 > Dell > www.dell.com.au**	**Toshiba Qosmio X500** Weighing in at 4.6kg, with a monstrous 18.4in display, the X500 offers great multimedia, a Core i7 CPU and a gamers graphics card.  **$2,699 > Toshiba > www.toshiba.com.au**
PHONE CONSUMER	**Sony Ericcson AIN0** A super duper phone, capable of streaming media from your PS3 and DNLA network devices over 3G or Wi-Fi. Also comes with a Bluetooth dongle.  **$849 > Sony Ericsson > sonyericsson.com.au**	**Nokia 6760 Slide** This side mounted slide out keyboard model is packed with social networking tools, and access to the Nokia Ovi store will keep you busy.  **$479 > Three > www.three.com.au**	**HTC Desire** Goodbye iPhone, hello Desire. This Android phone is the new pinnacle of consumer smartphones. Good performance, a solid experience and lots of apps.  **Plan > Telstra > www.telstra.com.au**
PHONE BUSINESS	**Blackberry Storm II** The Storm II is what the original Storm should have been. A good touchscreen experience, plus Blackberry's market leading email support.  **$799 > Vodafone > www.vodafone.com.au**	**Nokia E75** Works like a BlackBerry with the new Nokia Messaging push email service. You can configure up to 10 Gmail, Yahoo Mail, Live Mail and other free and hosted email accounts.  **$979 > Nokia > www.nokia.com.au**	**BlackBerry Bold 9700** The new BlackBerry flagship, a tad smaller than the 9000 but with a higher-res screen. Also runs on the regional HSDPA networks of Vodafone and Optus, and Telstra's NextG.  **Plan > RIM > www.blackberry.com**

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
MEDIA PLAYER	**Apple iPod nano** A new long narrow design with an accelerometer that kicks the nano into landscape mode when you hold it sideways. Now in 8GB and 16GB models.  $199 (8GB) > Apple > www.apple.com.au	**Sony Walkman X** This may be sacrilegious, but we think Sony's new Walkman X is better than the top iPod, with a 3.2in OLED touchscreen, noise-cancelling tech and Wi-Fi.  $649 (16GB) > Sony > www.sony.com.au	**Archos 5i** A tour de force — the most stunning media player yet, plays HD content and has in-built GPS, all running on Android. In 8GB to 500GB versions.  $445 (8GB) > Archos > itechinternational.com
MP3 DOCKS	**Altec Lansing octiv AIR M812** Unlike most other iPod docks, the dock and speaker connect to each other wirelessly up to 30m away. Produces a warm, well-balanced sound.  $799 > Altech Lansing > www.alteclansing.com	**TDK NX-04CD remote & Mic** Audio performance blows similarly priced docks out of the water, and looks great. But it can also play music off USB drives and SD cards.  $300 > TDK > www.tdk-media.com	**B & W Zeppelin** Simply the best-quality iPod dock speaker system around, even if not the most expensive. So good you need 320Kbit/s tracks to get the most out of it.  $1,300 > Bower-Wilkins > www.bower-wilkins.com
GPS	**TomTom XL340** A great beginner GPS. This model has a huge screen, visible in the day with an easy to use interface and clear, loud speaker.  $399 > TomTom > www.tomtom.com	**Uniden TRAX 5000** We love Uniden because of its philosophy of delivering on the fundamentals — bigger screens, easier navigation, better 3D maps.  $349.95 > Uniden > www.uniden.com.au	**TomTom GO 930** The top-of-the-line TomTom delivers traffic messaging, intelligent live routing, FM transmitter, voice-recognition and text-to-speech.  $849 > TomTom > www.tomtom.com.au
COMPACT CAMERAS	**Sony Cyber-shot DSC-WX1** The little brother of the TX1, the WX1 deserves a mention for the fact that it has all the same features for over $100 less. You just get 10MP instead of 14MP.  $449 > Sony > www.sony.com.au	**Kodak M320 Easyshare** The M320 is cheap, easy to use and produces great images. Takes a picture as well as a camera twice its price.  $180 > Kodak > www.kodak.com.au	**Sony Cyber-shot DSC-TX7** Heaps of features including touchscreen, sweep panorama and HD video, paired with great image quality.  $599 > Sony > www.sony.com.au
DSLR CAMERAS	**Canon EOS 5D** Though the price tag is heart stopping, the 5D is one of the best cameras out there, bar none.  $4,799 + lens > Canon > www.canon.com.au	**Canon EOS 550D** Easy to use, the 550D offers HD video and heaps of features, including the best LCD screen on the market.  $1,349 > Canon > www.canon.com.au	**Nikon D90** This is just sexy! The first DSLR with HD video, the D90 is the best non-professional camera you could get without sending yourself broke.  $1,699 > Nikon > www.nikon.com.au
HD CAMCORDER	**Flip Mino HD** HDMI, 30fps H264 recording, USB connector, touchscreen and easy to use. All of this for less than $300 means it's hard to go past for a pocket camcorder.  $299 > Flip > theflip.com.au	**Panasonic HDC-SD60** Great-quality HD video in a tiny form factor with all the gadgets, including touchscreen and face detection for automatic stills.  $799 > Panasonic > www.panasonic.com	**Sony HDR-XR520V** Want the best consumer camcorder out there? With 240GB HDD storage capacity, 12MP still images and so much more.  $1,699 > Sony > www.sony.com.au

	NOTEWORTHY	BEST VALUE	BEST PERFORMER
PHOTO FRAMES	**D-Link DSM-210**	**Kodak P720 Touch Digital**	**Samsung SPF-105V**
	25cm Wi-Fi photo frame that streams net content and can accept content via a "widget" located on the PC desktop. 	Kodak's entry-level photo frame, with a good quality 7in screen and the excellent Quick Touch Border which makes it really easy to navigate menus. 	Almost like a mini-TV with an impressive monitor and able to play MP3s and video files, plus lots of slideshow effects. 
	$499 > **D-Link** > **www.dlink.com.au**	**$140** > **Kodak** > **www.kodak.com**	**$399** > **Samsung** > **www.samsung.com/au**
HDTV	**LG PS70**	**Panasonic VIERA G15 Neo**	**Panasonic Z Series**
	Features in-built "Time Machine" DVR recording. For this model, the PS70, just add a hard disk. 	This represents the new state-of-the-art in plasmas, with brighter LCD-like pictures and faster motion image response. 	A super thin plasma that's lighter than others, with Full HD wireless transmission. This series sports all the bells and whistles. 
	$3,299 for 50in > **LG** > **www.au.lge.com**	**$3,299** > **Panasonic** > **www.panasonic.com**	**$5,999** > **Panasonic** > **www.panasonic.com.au**
TV TUNER	**Hauppage MiniStick-HD**	**Kworld DVB-T 395UR**	**AverTV TwinStar PCI-E**
	The size of a small USB key, it's the smallest Freeview-tuned digital TV stick in Australia — great quality, cheap, and perfect for notebooks. 	A basic HD tuner card that allows you to watch HD digital TV on your PC or notebook. It's not flash, but it works well, is portable and convenient. 	This is the best HD tuner on the market. Twin digital tuners for simultaneous record/playback, solid software and MCE compatible drivers. 
	$69 > **Hauppage** > **www.newmagic.com.au**	**$79** > **Kworld** > **www.kworld.com.tw**	**$159** > **Altech** > **www.altech.com.au**
DISC PLAYERS	**Sony PlayStation 3 80GB**	**Kogan Blu-ray Player**	**Sony BDPS350**
	Yes, it's a games console, but it also doubles as a Blu-ray player that's as good as any standalone devices on the market. It's the same price as some of the better ones, so do your sums. 	Basic, affordable. Plays back good quality HD and upscales DVDs. Now supports BD-Live (Profile 2.0) so it can receive internet content and upgrades. Good buy at $249. 	Superb HD playback quality and does great upscaling of DVDs to high definition. Unlike the $1,799 Pioneer, available for around $400 on the street. 
	$699 > **Sony** > **www.sony.com.au**	**$249** > **Kogan** > **www.kogan.com.au**	**$400** > **Sony** > **www.sony.com.au**
DVR	**PlayStation 3 PlayTV**	**Dvico TviX M6600-N**	**Panasonic DMR-BW850**
	Is it a console? Is it a PVR? Now it's both. The PlayTV offers a simple interface and good-quality recordings but chews through the PS3's hard disk drive quite quickly. 	There's little this won't do with dual HDTV tuners, 1TB internal storage, network playback, full 1080p as well as HDMI 1.3a support. 	This 2nd-gen Blu-ray recorder is a tempting all-in-one option for any lounge room. Includes 240 hours of HD recordings onto the hefty 500GB hard drive. 
	$169.95 > **Sony** > **www.sony.com.au**	**$699** > **Dvico** > **www.dvico.com**	**$2,199** > **Panasonic** > **www.panasonic.com.au**
ROUTER	**Netgear Rangemax**	**TP-Link TL WR941ND Wireless N**	**Linksys Dual-N WRT610N**
	A dual-band gigabit router built specifically with a huge list of features, including a seperable Guest network for visitors, and a media server. 	A Draft 2.0 N router with MIMO, using three adjustable antennas for speeds of up to 200Mbit/s. Performance is decent and the documentation is good. 	It does dual-band Wireless N (5GHz and 2.4GHz), is one of the best performers in testing and looks great. Comes with Linksys' superb LELA network setup wizard. 
	$299 > **Netgear** > **www.netgear.com.au**	**$129** > **TP-Link** > **www.anyware.com.au**	**$290** > **Linksys** > **www.linksys.com.au**

4G: Next-gen wireless

4G wireless is on the way. How does it work and what can we expect from this new technology? **David Braue** has the answers.

It took the 3G mobile industry a decade to evolve from early stages to ubiquitous access from mobiles, USB dongles and specialised devices like iPads. Yet with the recent launch of the world's first commercial fourth-generation (4G) wireless broadband service by Scandinavian carrier TeliaSonera, the race is now on towards a new generation of wireless services that could reach 1Gbit/s.

Vendors' self-serving bias has muddied the definition of just what '4G' means; for example, many initially saw 4G as seamless roaming between 3G mobile and fixed networks based on WiMAX, a high-speed wireless technology that's best for bringing internet services straight into the home.

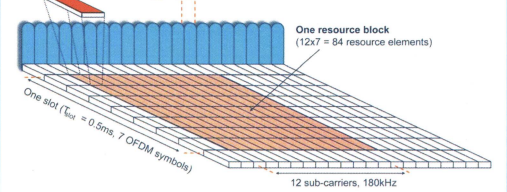
Some technology vendors have promoted WiMAX as the spiritual successor to Wi-Fi but carriers – seeking to protect their 3G investments – favour HSPA (High-Speed Packet Access) services instead. But those services initially struggled to reach 1Mbit/s throughput, and even Telstra's much-vaunted Next G network only delivers up to 8Mbit/s in practice. Compare that with vividwireless, the Seven Network-owned WiMAX ISP that recently reported average user speeds of 9.53Mbit/s.

Vendors may push WiMAX and HSPA as 4G – or intermediary designations like 3.25G, 3.5G and 3.75G – but they mean little. "The industry is just playing on perceptions," says Kursten Leins, strategic marketing manager for multimedia with Ericsson. "If they sell it as 4G, it must be better than 3G, right? But it's important to look at what any technology is actually doing at that point in time. You've got a wide spread of HSPA user experiences and peak or actual network throughputs."

Early confusion is dissipating, however, after the Next Generation Mobile Networks (NGMN) program, whose membership includes the world's largest telcos, set out minimum 4G criteria including quality-of-service (QoS) capabilities, efficient use of radio frequency spectrum, low latency, compatibility with HSPA roadmaps, and clarity of intellectual property rights.

Current 4G targets include a minimum transfer speed of 100Mbit/s, which is finally achievable with the 3GPP LTE (Long Term Evolution) technology deployed by TeliaSonera. As of mid-2010, the Global Mobile Suppliers Association noted 80 firm LTE deployments in 33 countries, with 30 more networks in the planning stages; Telstra and Optus are trialling the technology here – Telstra reported pushing data at 100Mbit/s over a 75km link – but neither has committed to a rollout.

LTE is an upgrade to current HSPA-toting 3G networks, and has delivered up to 160Mbit/s in testing. In the longer term, LTE will segue into the LTE Advanced specification, which promises blistering speeds of up to 1Gbit/s that will wirelessly connect company offices without any reduction in speed. Thanks to co-operation between 3GPP (the peak industry body for GSM, WCDMA and HSPA development) and 3GPP2 (which develops CDMA), networks running both can move straight to LTE.



4G standards use Wi-Fi-like OFDM to squeeze as much data into radio frequency spectrum as possible. Think of it like a biscuit factory, with conveyor belts carrying piles of cookies at a regular rate — and capacity increased by adding more conveyors. (Source: Ericsson)

BETTER LTE THAN NEVER

Given market confusion over what '4G' means, it's a relief that the industry finally has a hard target. But what exactly is LTE, and how does it work?

Like 802.11a/b/g Wi-Fi, digital TV's DVB, digital radio's DAB and other standards, LTE uses a technique called orthogonal frequency division multiplexing (OFDM) to carry data on the downlink; Single-Carrier FDMA (SC-FDMA), is used for the uplink.



TeliaSonera's commercial 4G network uses a Samsung GT-B3710 dongle, here shown plugged into a Samsung netbook.

To understand how OFDM works, picture a biscuit factory: biscuits are made, one after another, from dough squirted onto conveyor belts at equal intervals. If you want to make more biscuits at a time, you add more conveyor belts. Your total capacity is limited by the width of your factory floor.

Think of the biscuits as bits of data, which in OFDM are carried between the LTE base station and your smartphone using 'tones' or subcarriers – individual radio frequency bands each just 15kHz in width. Each band is broken up into seven OFDM 'symbols' that together last 0.5 milliseconds. In other words, each conveyor belt carries seven biscuits past a given point every 0.5ms.

Now imagine that you decide to increase biscuit-making capacity by stacking 2, 4, or 6 biscuits on top of each other. LTE uses 'modulation schemes' that allow each symbol to represent 2 (QPSK modulation), 4 (16QAM modulation) or 6 bits (64QAM modulation). This means LTE can transmit 28 to 84 bits per millisecond, per subcarrier.

When you connect to an LTE base station, your device uses 'resource blocks' that tie together 12 subcarriers – consuming 180kHz of radio spectrum in total – to carry up to 1,008 bits per millisecond, or just over 1Mbit/s. Combine 96 subcarriers to carry eight resource blocks at once, and you've got an 8Mbit/s wireless connection – but you'll be tying up 1.44MHz of radio frequency spectrum (data is multiplexed so a subcarrier can carry traffic to and from multiple devices at once).

LTE can adapt to different amounts of spectrum including 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz and 20MHz. Note that at 20MHz, which equates to 111 resource blocks, you're getting over 100Mbit/s bandwidth. But spectrum is a shared resource, so the more users at once, the less bandwidth available to each.

LTE is quite flexible. For example, it offers eight quality-of-service (QoS) levels for guaranteed service quality. It also supports both frequency division duplexing (FDD) – 'paired frequencies', in which data is downloaded using one subchannel and uploaded using another – and time division duplexing (TDD), a slower and less power-efficient 'unpaired' technique, in which data is downloaded over a subchannel a certain portion of the time. FDD is the reason wireless broadband services are so asymmetric but it's more spectrum-efficient than TDD. Carriers balance the two to maximise bandwidth to the largest number of simultaneous users possible.

A NEW-GENERATION ARCHITECTURE

As well as carrying data, LTE uses an IP-based architecture built around a simplified network architecture called SAE (System Architecture Evolution).

Existing networks tend to use a hub-and-spoke design, with base stations connecting to central controlling nodes that use SS7 or SIGTRAN protocols to manage handoff of calls and data sessions between network control nodes.

LTE replaces older signalling with the 3GPP-favoured Diameter protocol (**bit.ly/bsJELJ**), which authenticates and authorises sessions as they're handed between base stations. Since the SEA structure is flat, each base station can talk to the other base stations, creating a self-configuring environment that obviates the need for a separate control node. Since any base station is only one hop away from the internet LTE latency can be less than 10ms, compared with hundreds of milliseconds in 3G – helping applications run faster.

BRINGING 4G TO LIFE

LTE is gaining momentum, but some call it 3.9G in anticipation of LTE Advanced, a successor specification that will push bandwidth up to 1Gbit/s – making it the first standard that can be rightfully designated as 4G.

LTE Advanced will require large amounts of contiguous radio frequency spectrum in low-frequency bands that provide long-distance, high-bandwidth transmission. The best target is the 700MHz range, which won't be opened up until after the last analogue TV goes black at the end of 2013.

Government policymakers are considering the best policy for managing that bandwidth, but the process is complicated by the need to 'stack' existing allocated frequencies together. In late June, the government announced it will provide 126MHz of usable spectrum in the 700MHz band – between 694MHz and 820MHz – with spectrum auctions to run from late 2012. A decision on 2.5GHz spectrum, which can also be used for LTE, is expected soon; together, these decisions will pave the way towards a clearer, faster 4G future. ETTD

The path to 4G. (Source: Ericsson)

APC MAGAZINE MASTER BUILDER PRO BUILD

One of the joys of computing is building your own PC from a collection of parts you have carefully chosen yourself. Each month a Master Builder will configure a PC for a specific task and pricepoint, recommending the best components for the job.

Home theatre and multimedia system

Excel Computers' Master Builders put together a media centre system that has plenty of grunt.

Excel Computers is a Sydney-based computer builder and retailer whose systems regularly win awards in PC magazines. Excel's Master Builders, Ben Lin and Jimmy Su, have created a home theatre PC with guts – one that can handle gaming and general multimedia, as well as standard home theatre tasks such as TV recording.

CORE SYSTEM

SYSTEM COST $1,756

CPU

INTEL CORE i5-750 – $262

This processor is the current mainstream performance king, at an affordable price. The 45nm process provides users with room for overclocking. The generous 8MB Level 3 cache, the progressive Nehalem architecture and Lynnfield core, not to mention the amazing Turbo Boost Technology, all help forge the king's sword!

MOTHERBOARD

GIGABYTE GA-P55A-UD3 – $173

Its latest USB 3.0 and SATA 3 technologies speed the data transmission rate by up to 10 times. The integrated Gigabit network interface card won't be a bottleneck when you're watching online HDTV videos *and* downloading HD movies. We find that GIGABYTE's Ultra Durable 3 technology produces more stable performance because of the heavier use of copper, which keeps areas of the motherboard cooler. The board's home-theatre-quality 8-channel high-definition audio is a good solution for a PC-based media centre such as this one, so you don't have to spend extra time and money looking for a PCI audio device.

RAM

Corsair 4GB (2 x 2GB) DDR3-1,333MHz – $165

Two sticks totalling 4GB of memory running at 1,333MHz in dual-channel are adequate for the heavy loads of a media centre.

GRAPHICS

MSI R5770 Storm 1GB – $180

ATI's HD 5770 graphics card supports DirectX 11 very well; you can play Dirt 2 smoothly in Full HD mode. Watching a Full HD movie? Just a piece of cake. And its power efficiency is outstanding as well.

HARD DRIVE

2 x 1.5TB Western Digital WD15EARS – $236

Say you have to go overseas for a whole month but don't want to miss your favourite TV shows? Easy: this media centre has up to 2.8TB of storage space, with 100GB reserved for the system. Even when one hour-long HDTV show consumes 2.5GB, the drive is able to keep recording for up to 1,100 hours, which is more than 45 days. So, enjoy your trip!

OPTICAL DRIVE

LG Blu-ray Rewriter BH10LS30 – $224

An absolute, full-featured Blu-ray burner. Easily play Blu-ray movies or burn your favourite TV shows onto Blu-ray discs. Blu-ray means you are able to store much more with less discs. This drive is also compatible



Excel's Master Builders, Ben Lin and Jimmy Su, have put together a cracker of a media PC.

with all BD formats and supports LightScribe technology.

WIRELESS NIC

D-Link DWA-547 RangeBooster N Wireless PCI Card – $80

RangeBooster N technology provides the kind of high-performance wireless network connection necessary for bandwidth-demanding multimedia applications such as video and music files.

TV CARD

Compro VideoMate T750F+ – $125

The Compro's outstanding HD digital TV tuner delivers good pictures. Dual signal input guarantees that you can watch digital and analogue TV shows at the same time. The software that comes with this card is very easy to use. Scheduling it to record your favourite TV shows is effortless. Even when your machine is in standby, hibernation or shut-down mode, the card is able to wake it up for scheduled recording.

PSU

Great Wall GW-660SEL – $85

This economical brand may save you some hard-earned money. You may not have heard of Great Wall, but it's a specified OEM manufacturer for many giants of IT. It's also the most popular PSU maker in China because it's regarded as making high-quality, safe and durable products. This 660W PSU provides you headroom to upgrade your machine.

CASE

SilverStone LC20-M – $227

Looking like a classic amplifier, this is a dedicated media centre case, with a graceful aluminium front panel. The generous internal room features two 5.25in and six 3.5in internal drive bays. There's also cooling everywhere (2 x 80mm rear exhaust fan slots, 2 x 92mm/80mm front fan slots, 1 x 80mm side fan slot). It ensures that long recordings are guaranteed – even in the middle of summer.

EXTRAS

MONITOR

LG 23in E2340 LED widescreen — $271

The LG E2340 LED is so slim that it won't occupy much room on your desktop. The 23in 16:9 LED screen features a mega contrast ratio of 2,000,000:1 and ultra-fast response time. It delivers high-quality pictures in Full HD resolution, plus has brightness and cinema mode functionality. Don't forget the money you can save because of the power-saving ability from LED technology.

KEYBOARD/MOUSE

Logitech Wireless Desktop MK700 — $86

This cordless keyboard/mouse combination is really comfortable because of the in-curve key design. The sensitive and quick-scrolling mouse delivers great sensitivity, especially when you are gaming. Combined with its outstanding battery life, this combo deserves our recommendation.



OS

Windows 7 Home Premium 64-bit — $125

Windows 7 is more reliable and faster than Vista. We need the 64-bit operating system to fully utilise our 4GB RAM and give our customers headroom to add more memory if they want.

Total with extras: $2,183

ASUS MASTER CHALLENGE 2

GAMING PC WINNER

Josh Herd, who spends his days underground in a uranium mine, is the winner of the second ASUS Master Challenge.

APC and ASUS judges have selected the winner of the second ASUS Master Challenge. Contestants had to define a Gaming PC around some motherboards and graphics cards selected by ASUS (see images below). The winner is Josh Herd, of Darwin, whose PC impressed the judges for the way it maximised the ASUS parts. Josh is a water blaster in the Ranger uranium mine in Jabiru, in the Northern Territory.

He wins an ASUS Republic of Gamers Maximus III GENE motherboard.

Go to apcmag.com/masterbuilder for the entry form.

MAKE SURE YOUR ENTRY INCLUDES BOTH A MOTHERBOARD *AND* A GRAPHICS CARD FROM THOSE LISTED BELOW.

ASUS MOTHERBOARDS



P6X58D PREMIUM

MAXIMUS III EXTREME

P7P55D-E DELUXE

ASUS GRAPHICS CARDS



EAH5850 DIRECTCU TOP



EAH5870 TOP



5970 WITH VOLTAGE TWEAK

JOSH'S PC UNLEASHING THE BEAST

Herd defined a gaming system that he said was designed to *"unleash the beast!"* It was built for performance, *"with an ROG mobo, 3-way ASUS ATI cards and great overclockability. This system will eat games, eat the games' sequels, and their trilogies!"*

MOBO: ASUS Maximus III Extreme It's part of the ROG by ASUS and is aimed at gamers and overclocking. It also has five PCIEx16 slots with capability to run 3@x16 which is great if you want to run three graphics cards for some extreme numbers. Supports up to 16GB DD3 memory and has two USB 3.0(NEC) ports and two Marvell 6GB/s SATA which is right up there in performance terms.

GRAPHICS: ASUS 5970 with Voltage Tweak – 3-way *"I picked this graphics card simply because it's a monster and will eat up just about any game you can throw at it. There's a few combinations one could run on this board, two 5970 VTs (hell even 3!) two 5870 TOPs or I'd probably go one 5970 VT plus a 5870. I really can't see a reason running any more than three GPUs in most games."*

CPU: Intel Core i7 860

COOLER: Thermalright Ultra-120 eXtreme

MEMORY: 8GB OCZ DDR3 PC3-12800 Platinum

DRIVE 1 & 2: OCZ Vertex Series 120GB

DRIVE 3: Western Digital Caviar Black WD2001FASS 2TB|

OPTICAL: Pioneer BDR-205 Black Blu-ray Serial-AT

PSU: OCZ Z Series 1000W

CASE: Antec Twelve Hundred

MONITOR: Samsung P2370HD

KEYBOARD: Logitech G19

MOUSE: Microsoft USB

SPEAKERS: Turtle Beach Ear Force HPA2.

For Josh's spec in full, go to **apcmag.com/masterbuilder**

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※ Actual product specifications may vary depending on the model.



HARDWARE DIRECTIONS

Nick Race takes a look at where the PC hardware industry is taking us this year.

There are three big shows for the global IT industry. The year kicks off with the Consumer Electronics Show in the US, which looks at all the finished product you'll expect to see on the shelves for the year. Number two on the list is CeBIT, Germany, which is an amalgamation of software, systems and services. Last but not least, is Computex in Taiwan, where the PC component makers show their wares and the rubber really hits the road.

Just from these three shows we see nearly every tech trend for the next year. With announcements on new technologies, new platforms and new specific products coming thick and fast, there's little we don't get in a preview or sneak peek, even months and months before they are likely to go on sale. That said, there are always surprises, and many cards played close to the chest.

This year's Computex, the show that *APC* really gets its teeth into, showed us the trends for computer hardware we can expect to see up until the end of the year. From the show floor we've identified three major areas where the manufacturers are concentrating: efficiency, size and performance. Now that sounds very broad, and it is, but specific products show us what kind of results these trends can give us.

EFFICIENCY

In the broad sense, manufacturers are constantly aiming to improve efficiency – both for themselves and their customers (it's a good sales pitch). The reality of increasing efficiency is very applicable to all computer users. Big this year on the show floor was high-efficiency power supplies. A number of PSU vendors have pushed hard to create power supplies that meet the new, and *very* high power efficiency standards for desktop systems.

The prime example is the new 1010GX 1,050W power supply from Cougar. This PSU earned the very hard-to-attain 80 PLUS Gold badge from the 80 PLUS industry group. What it means is that the power supply runs at a minimum of 80% efficiency no matter what its load (that's Bronze accreditation), while to get Gold, the PSU needs to stay well above that again. The 1010GX runs at 93% per cent efficiency at 50% load (where most people will actually be running) and at worst case at 89% efficiency. Sounds good, but what that really means is lower power bills, less system heat and a greener footprint. This PSU took out a coveted Design and Innovation award at Computex.

More efficiency was evident with new ranges of super low-power computing devices. Companies like VIA Technologies had swathes of ultra-low-power designs to show off, and with the ever increasing demand for truly portable computing (be it tablet, MIDs or smartphones) both power/heat and battery efficiency will soon be king.



New small boards from Zotac were on display.

Highly efficient desktop power supplies are beginning to show up.

SIZE

Going back to the current and huge demand for ultra-portable computing, the matter of size has become one of the new big buzzes around the halls of Computex. This year, we've seen a lot of focus put on smaller footprint products. Tablet PCs, lower power processors like the Atom from Intel, AMD's Fuzion combined CPU/GPU product and components like the Micro-ATX H55N-USB3 motherboard from Gigabyte are all seeking to reduce the physical footprint of computing.

The secondary focus here is to make things smaller without compromising on the performance, unlike in the past. The H55N-USB3 is a good example of that. It's GIGABYTE's first Mini ITX motherboard, and though it only measures 17 x 17cm, it still packs in Core i3/i5/i7 support, PCI Express x16 for a full-sized graphics card, multiple outputs and USB 3.0. It's tiny, but it still has all the bells and whistles of a much larger board.

PERFORMANCE

In computing, performance is king. Seeing vendors focusing on performance is not something new, but the levels at which this is pushing the industry as a whole, plus support from unexpected areas, is showing just how much being the best or fastest is worth to the manufacturers.

Over the past 24 months, mainboard manufacturers ASUS, GIGABYTE and MSI realised the value in attracting those who really push the limits of their hardware. Specifically, overclocking and the overclocking community.

Though we can guess that the amount of people who actually engage in high-end overclocking, it's the trickle down effect the companies are aiming for. Overclocking awards and having your motherboard or VGA card at the top of the OC tables encourages geeks to buy your hardware. And geeks love to talk about technology – and almost universally will recommend to others what they run themselves, even if it's just the brand.

But to get to the top of that tower takes a lot of work – and some serious engineering. GIGABYTE really impressed with a demonstration of the new power design in their high-end motherboards. The GIGABYTE X58A-UD9 board was shown delivering 1,500W (2.15 volts with 700 amps) through the motherboard's power circuits. It's really not something that anyone should (or could, outside of a lab) do, but it demonstrates what kind of R&D is being put into the design of these kinds of products. The good news for the rest of us is that these kinds of technologies trickle down into the lower-end products over time, and that means a more robust design, less product returns and more stable systems.

Another trend we saw at Computex is the adoption of USB 3.0 and SATA 6GB/s by more companies. Though motherboards have been packing SATA 6GB/s and USB 3.0 ports for months now, the products to plug in to those ports have been far between and sometimes less than impressive. It's been a chicken and egg situation: lots of companies haven't wanted to make product for USB 3.0 because there aren't a lot of users, and users aren't investing in the technology specifically because there weren't a lot of products. Thankfully, that cycle has been broken.

The show floor was packed full of USB 3.0 devices, mostly external hard disk drives and finally USB 3.0 memory keys. A couple of the vendors quite creatively are using RAID-like designs in the banks of memory in the USB 3.0 memory keys, so the flash memory has a chance at keeping up with or performing at the high-speed USB 3.0 interface. So expect to see some quick memory sticks out there soon.

Last but not least there has been another technology that has had us excited for quite some time: the solid state hard disk drive. SSDs have been available for a while, and while they offer the fastest hard disk drive speeds on the market, they haven't been paired with the fastest drive connection on the market. SATA 6GB/s really gives these drives an opportunity to shine. With only one controller available at the moment that supports SATA 6, it's not as widespread as we'd like, but expect many more solutions on the horizon.

So what will the PC of the next 12 months look like? Firstly, we think it will be small. Tablets and decent performance from integrated graphics will remind us that you don't need a 4-foot-high aluminium monstrosity in your study to do what you want. Second, we're going to see a much higher emphasis on green computing, but this time in terms of power efficiency and size. Last, but not least, components will get better overall. Buying a mid-range product will see you with many of the features of previous higher-end kit.



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PROJECTS, TIPS & TRICKS



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HOW TO ENTER THE WINPAD

Seeking a Windows challenger for the iPad, Microsoft could find the third time's the charm.

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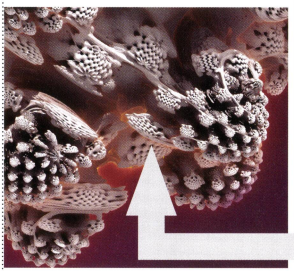
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GAMES

GAMING METTLE

Q Before I pay a lot of money for one of the newest computer games, is there any way of finding out for sure whether my middle-aged computer is even able to play it?

John Merlo

A Without getting into questions about what kind of computer specs you have and what games you want to play, we'll ask you to go to Futuremark's web site (**futuremark.com**) and run the Game-o-Meter online-based benchmark. It will test the gaming performance of your system and tell you how specific games will fare. It will also outline the chosen game's minimum and recommended system requirements and where your machine fits.

It lists your CPU and graphics card, and the ideal graphics card and CPU specs to play the game at good resolution and frame rates. We ran it on the notebook this tip is being written on, and sadly found that this Acer with a Core 2 Duo T8300 and NVIDIA GeForce 9500 GS won't even play Battlefield: Bad Company 2 (the game featured in our online gaming tournament).

WEB

EMBED HTML5 VIDEO

Q So I keep hearing HTML5 is the new standard for web video. How do I create HTML5 videos? (That is, what file format and codec do I use, and how do I embed them on my site?)

Jenny Watson

A Whoa, hang on a minute. HTML5 is not a video format or codec, but just a version of HTML that lets you embed video into a web or mobile device page. HTML5 video is not a container (eg. QuickTime or MPEG), nor is it a codec (eg. H.264). As it relates to video embedding, it's simply a version of HTML that provides a <video> element for embedding video into a web page. With this element, you can embed virtually all video containers and codecs. So why is HTML5 such a big deal? Because any browser that is compatible with HTML5 does not need a plug-in to display the video, making HTML5 ideal for mobile browsers. Using HTML5 to display video is remarkably similar to displaying images with the tag. To embed a video on a page, you use <video src="videofilename.mp4"></video>, adding other relevant attributes, such as width= or height= , i.e, <video src="videofilename.mp4" height="640" width="480"></video>. To display the video controls, you can ask the browser to use its own by adding the 'controls' attribute, or you can create one with HTML, CSS or JavaScript.

The main issue with HTML5 right now is what browsers support it. Problem one is that Microsoft's Internet Explorer 7 and 8 don't, although the upcoming IE9 will. Chrome, Safari, Opera and Firefox do, as do the iPhone, iPod and some Android mobile browsers. Problem two is that the browsers that do support it (Chrome, Safari, Opera and Firefox) differ in their support of what video containers you can embed with HTML5. So, if you want to embed video on your site using HTML5, then you'll have to encode one file in the OGG format for the video to display in Firefox and Opera, and another in the H.264 format for it to show in Safari, IE9, iPhone and Android. Google's Chrome will display both. And, of course, you'll still need to add a fallback video encoded for Flash for IE7 and 8 – which don't recognise HTML5. So, in other words, to embed a video using HTML5, you'll need to encode it in two different formats as well as providing a Flash option for IE7 and IE8. If it's all too much, there are already several scripts for embedding video in HTML5 on the web. Video for Everybody (**bit.ly/BlxiB**) is an example – basically a chunk of HTML code that does the job.



DOWNLOADING

FIND CACHE FILES

When you play a streaming video from YouTube or any other video service, your browser will store it temporarily in its memory cache – so the easiest way to keep that video file is to copy it to another location, instead of having to download it separately with a download tool. But finding that cache and then sorting through the flotsam and jetsam can be an absolute pain. Free Cache View (**bit.ly/bKIMPy**) is a free Windows utility that finds and opens the browser caches of Firefox, Internet Explorer and Opera. It lets you select and save files, as well as sort through them by file size, type (ranging from videos and audio files to scripts and CSS files) and time of access. Brilliant.

INTERNET

SPEED UP WEB SURFING

Q I have quite a slow broadband connection. What do you think of web accelerators?

Carey Smith

A Rubbish. All they do is pre-cache your popular web pages in the background. So if you go to those sites only, they might be faster, but whenever you surf somewhere else, the web accelerators are actually eating into your bandwidth. There are other things you can do that are more effective. One is to use the fastest browser, and that's Safari, hands down, even faster now with version 5. The new Opera 10.54 makes bold claims that it's the fastest browser on earth, but we haven't tested it yet. The other thing is to use a faster and better DNS server than that provided by your ISP. This writer uses Google Public DNS (see **bit.ly/7R36iz** for instructions) because it's geared for speed. Among other things, it implements prefetching for many popular domains, where, before the TTL on a record expires, Google refreshes the record continuously independent of user requests, allowing it to serve many more DNS requests in a given time. It also implements security measures that reduce the risk of spoofing and similar attacks. OpenDNS (**opendns.com**) is another alternative, though it tends to be geared towards providing better security than outright speed.

SECURITY

FINDING AND CRACKING PASSWORDS

Q One of our employees who's left the company also left various password-encoded Excel files and ZIP files on his PC. Is there a universal password-cracking tool that finds all passwords?

J. Williams

A You're better off searching for password-cracking software created for the specific application. For Excel files, try Advanced Office Password Recovery (**bit.ly/9sUwxO**). The US$49 Home version will do the job, but if you want to crack files password-protected by any Office app, then get the professional version, at US$199. For the ZIP files, use VZPRP (**zipcure.com**) which is one of several ZIP password recovery tools. There is a password-cracking or licence key finding tool for virtually any application you use. One that finds passwords across many applications is Identity Finder (**identityfinder.com**), a free Windows utility that scans your computer for stored passwords as well as other sensitive info such as credit cards. We ran it on one of our PCs and it quickly found 18 stored passwords. The free version of Identity Finder can find passwords in browsers, as well as Word, Excel, PowerPoint, Adobe PDF, text, HTML and RTF, while the more expensive Pro to Enterprise versions are even geared towards finding Australian Tax File Numbers! There are also tools for retrieving software licence keys – perfect for when you need to shift some software to another computer and have lost the keys. One that works is Office Key Remover (**bit.ly/axW44H**), although you have to navigate through some annoying sales pitches before it finds your Microsoft Office keys.

The bottom line is: anything on your computer that is not encrypted to government standards can be found and cracked.

AUDIO TIP

EXTRACT YOUTUBE AUDIO

Even though YouTube is all about video, it's also a major destination for anyone looking for music. But while you can download the



clips you can't listen to them on your MP3 player. **FetchMP3.com** is a great online utility for extracting the audio from YouTube video clips and playing them on your portable device. The best thing about it is that you don't have to download the file – just supply FetchMP3 the URL of the YouTube video, or, alternatively, tell it to search for songs. When all the videos are selected, FetchMP3 will process them and download them to your computer. Songs are processed at different audio levels – the highest ones requiring registration.

SECURITY

VIDEO SURVEILLANCE

Q Is there any way that I can keep an eye on my house with my PC webcam while I'm away, but logging in remotely with a mobile phone instead of a PC?

Paul Roberts

A Forget about logging in to watch video of your premises with your mobile. The simplest way to achieve the same effect is to use surveillance software that emails you screengrabs from a webcam. You can then use your mobile phone to view these. An example is TeboCam (**bit.ly/aZh0Z7**), a free surveillance program for Windows PCs. If it detects motion in your PC or notebook webcam's field of view, it will send you an alert as well as take screengrabs every few moments and email them to you.

You can set its motion detection sensitivity and the size of the detection area. It can also FTP the images to a server. Doesn't get much simpler or lower cost than that.

SECURITY

FAST SECURITY

Q Once Microsoft Essentials became available, I couldn't get rid of McAfee and Norton fast enough, but I still worry about system resources being hogged by the antivirus program. In your opinion what is the antivirus with the lightest impact on a computer performance?

John Wu

A If you're using a Windows system, you're mad not to use Essentials. However, if your concern is impact on system resources you should check out Panda's cloud-based antivirus solution (**bit.ly/34F3s7**). This is a radical approach to dealing with PC malware. Instead of having an antivirus desktop app doing all its processing of signatures and other housekeeping on your PC, Panda's solution does it on a Panda server in the cloud, downloading only the necessary scanning and PC protection utilities to your machine. As a result, Panda Cloud Protection takes up around 15-20MB of RAM compared to traditional antivirus solutions that take up more than four times as much. This is a clever way of responding to the Microsoft Essentials tsunami that is pretty much devastating the third party antivirus software industry. Other antivirus providers have gone down the path of extreme gold plating, providing exceptional protection as well as increasingly turning into all-round PC utility packages. But the problem, of course, is that many users don't want to pay for something they believe should have been provided free in the OS by Microsoft in the first place.

WINDOWS TIP

BOOT MANAGER EXTRAORDINAIRE

It would take a pretty good boot diagnostic tool to excite us these days, and Soluto (**www.soluto.com**), an Israeli firm's take on PC diagnostics, has managed it. The boot diagnostics/manager is part of the Soluto Anti-Frustration Software solution. It analyses your PC's boot time and processes and suggests ways to make the PC boot up faster. It tells you how long the boot takes and what applications are booting, but what makes it different is that it also helps you decide what applications to keep, remove or delay to speed up the startup process, categorising them into No-brainer (can be removed from boot), Potentially Removable (can probably go but may impact on some programs) and Essential (services and apps that are necessary to the functioning of the system). So instead of just wondering blind as you do with other boot speed utilities, this program tells you the consequences of your actions.

PRIVACY
SECRETS INSIDE

Q Is there a really simple way of emailing information secretly to a friend without having to worry about encryption keys and security and all that stuff that may alert others to this?

Name withheld

A Use steganography – the science of hiding messages instead of just encrypting them. One of the neatest ways to keep information from prying eyes is to hide the file inside another file so no-one will ever know its there. You can then send the file and no-one will twig. An example of this is programs like JPG+FileBinder (**bit.ly/dgAmD8**) which can hide a zipped folder full of private goodies inside a JPEG image that you can attach to your email. JPEGs are great for hiding stuff in because they can vary dramatically in size, not arousing suspicion – although you don't want to go too far and insert a ZIP containing several torrents into one.

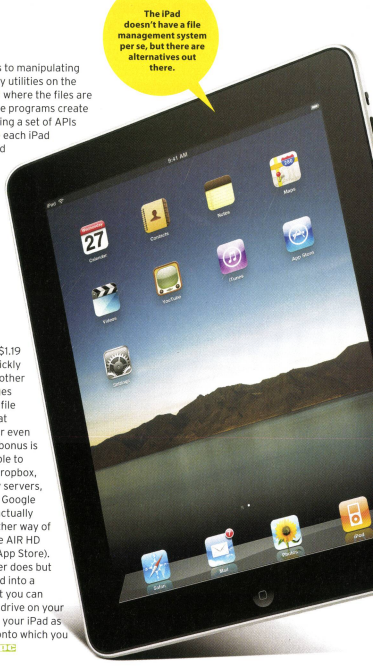
IPAD
FILE SYSTEM

Q I bought an iPad and am very pleased with it, finding it far more convenient in many instances than a bulky netbook, but there is one thing that I am surprised about: the complete lack of file system. How do people manage their files on this thing?

Name withheld

A The iPad doesn 't have a file manager in the Windows Explorer or Mac Finder mould, but you have two options when it comes to manipulating files on it: one is third party utilities on the App Store that let you find where the files are stored on the device. These programs create a pseudo file system by using a set of APIs that let them locate where each iPad app stores its user files and then make these available to you from a central point. The second option is to set up cloud-based storage such as Dropbox, download the Dropbox client to your iPad, and just keep all your files in there (and sync the same data across all your other devices on which Dropbox works).

An example of a simple API-based file locator approach is GoodReader ($1.19 in the App Store). It will quickly find user files attached to other iPad apps (such as the Pages word processor) and offer file management functions that include zipping, emailing or even password protection. The bonus is that GoodReader is also able to connect to Apple's iDisk, Dropbox, Box.net and other WebDav servers, as well as services such as Google Docs, although it doesn't actually synchronise the files. Another way of managing files is to use the AIR HD application ($12.99 in the App Store). This does what GoodReader does but additionally turns your iPad into a wireless network drive that you can actually map as a network drive on your Mac or PC. It lets you treat your iPad as another drive on your PC onto which you can drag and drop files. EDITED



XGAMER FREE WINDOWS INSTALLATION!
Built With Genuine Windows 7® Home Premium
Buy Microsoft Windows 7, Vista or XP with selected XGamer systems and we will install it for FREE!
WWW.GAMEDUDE.COM.AU
PH: 07 3387 1500 - ADDRESS: 3353 PACIFIC HWY, SPRINGWOOD, QLD, 4127

WINDOWS VIEW

Enter the WinPad...

Seeking a Windows challenger for the iPad, Microsoft could find the third time's the charm. . .

APC EXPERT



DAVID FLYNN

Former *APC* Editor and author of four best-selling books on Windows, David has been covering Microsoft's OS since the days of Windows 2.0.

Picture a personal 'slate' device with a touchscreen, a touch-optimised UI and an on-screen keyboard for 'natural interaction'. Give it 'always connected' internet capabilities, music and video playback and all-day battery life. Whack on a $600 price tag.

It *could* be the iPad – but it's not. That checklist is what Microsoft promised for its two previous attempts at igniting the tablet market: the Tablet PC of 2001, and the 'Origami' ultra-mobile PC of 2006.

To Redmond's chagrin, the iPad ticked all those boxes, and by riding on the back on the iPhone it looks set to become another runaway success for Apple – despite Microsoft's decade-long head start in the slate space.

There are plenty of reasons why Microsoft's tablets proved so hard to swallow.

They were always built around the full-blown Windows OS – first XP, and then Vista – which was simply too demanding for the processors (and other tablet technology) of the day.

Touch-friendly operation tended to be bolted on as an after-thought, an additional UI layer or 'Touch Pack', rather than woven into the OS, and a pen or stylus was considered the most natural form of input.

But it's also worth noting that the market itself has undergone dramatic changes. The first wave of Tablet PCs were aimed at business users and favoured 'convertible' designs that added a swivel screen to a conventional keyboard-based notebook – there was nothing thin and light about those machines.

Five years later the Origami-class UMPC took a step towards the 'mobile lifestyle' but still sat in the realm of mobile professionals rather than everyday consumers.

The iPad arrived in a decidedly different era: one geared towards consumers *and* content consumption.

After all, Microsoft's past tablet forays happened before the Web 2.0 world of YouTube and online services, social networking and cloud computing. And the 'internet everywhere' connectivity provided by fast and affordable 3G was years away.

Apple also enjoyed a market made ready by the iPhone's radical take on stylus-free touchscreens and the creation of the app ecosystem.

And whereas Microsoft's original vision of tablets was as full-function computers, an alternative to the desktop or notebook, Apple created the iPad as a companion device in a unique class of its own.

Now Microsoft is gearing up for its third take on the Windows tablet, but this time it's shaped by the same forces that created the iPad. Boffins might call it Tablet PC 3.0 – we prefer to think of it as the WinPad.

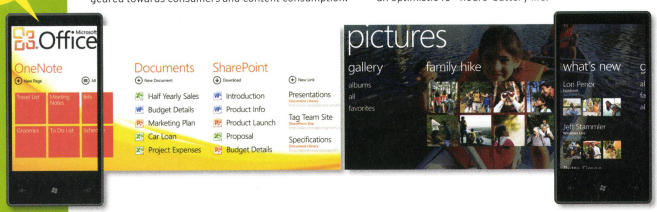
We can't take credit for that name, however. It's a stroke of irony that Microsoft itself cooked up the term in 1994 during development of a Windows-based PDA running a lightweight OS, before the project was aborted and rolled into what became the first Windows CE handheld device.

Microsoft also finds itself with three paths for bringing the WinPad to market.

The first is to use Windows 7, which has gesture-based multi-touch support (a hand-me-down from Microsoft Surface) baked into the OS, along with the much-improved handwriting recognition engine found in Windows Vista.

ASUS has already announced the first mainstream Windows 7-based tablet in its 12in Eee Pad EP121. The slate runs Windows 7 Home Premium on an Intel ultra-low voltage Core 2 Duo processor, for which ASUS claims an optimistic 10+ hours' battery life.

If Windows Phone 7 scales well into the slate form factor, Microsoft would have its answer to Apple's iPhone OS.





Essentially a thin and light notebook which swaps the keyboard for a touchscreen, ASUS will also offer a compact desktop docking station with a slim cordless keyboard, and a notebook shell into which the Eee Pad slides to become a more conventional ULV netbook complete with keyboard.

Intel is also developing a custom 'system on a chip' to power Windows 7 slates. Codenamed Oak Trail, the processor is a low-voltage tweak on the Atom Z600-series 'Moorestown' superchip that targets smartphones and tablets.

But Moorestown is made for Linux distros like MeeGo and Android and doesn't support Windows. Oak Trail will be fully Windows-compatible as well as gaining Serial ATA connectivity, 1080p Full HD video and HDMI output.

The bad news? Intel won't ship Oak Trail silicon until year's end, with systems arriving in the first quarter of 2011.

An alternative approach is to use the pint-sized Windows Embedded Standard 7 operating system.

This cut-down version of Windows 7 breaks the monolithic desktop OS into a series of Lego-like components that can be plugged together. Almost any Windows 7 desktop component – such as Internet Explorer 8, Windows Media Player 12 and Silverlight 3 – is available as a plug-in module to OEMs, who can also whip up their own UI to sit above Microsoft's kernel and middleware.

There's already a WES7-powered slate on the launching pad – it's the second member of ASUS's Eee Pad family, the 10in model EP101, which the company has pledged for early 2011 at US$399-$499.

ASUS is positioning the 10-incher as a "supplementary Windows-based portable tablet PC for casual computing", and it's much closer to the iPad than its 12in sibling.

In addition to running a bespoke OS, the slate is powered by an ARM 'system on a chip' processor (NVIDIA's Tegra 2) with Wi-Fi and optional 3G, and solid state storage from 16GB to 64GB. The prototype has an ultra-slim 12.2mm profile and sets the scales to barely wobble at 675 grams.

ASUS has bolted its own slick UI atop the modular but barebones Windows Embedded OS. The interface was developed in partnership with Microsoft, and it's believed that Redmond may have done a lot of the heavy lifting due to the likelihood that the Eee Pad could become a poster child for the Windows Embedded platform (if not Windows slates as a whole).

Microsoft's third path to WinPad is Windows Phone 7, the company's *true* made-for-mobile OS.

Yes, Windows Phone 7 is intended first and foremost for smartphones – an origin it shares with Apple's iPhone OS, which of course now powers the iPad.

The Windows Phone 7 model is strikingly similar to that of the iPhone and iPad. It's a closed ecosystem that will require all-new apps – there is no support for legacy apps written for Windows Mobile 6.x or before – and those apps will be available only through Microsoft's Windows Marketplace for Mobiles store.

And Windows Phone 7 happens to be a superb mobile OS. We've spent enough time with demo builds to appreciate its elegant design, home screen widgets or 'live tiles' and social networking integration.

There's no reason to think that Windows Phone 7 can't work on displays larger than the average smartphone. Indeed, its multi-panel 'panorama' design would lend itself beautifully to a 10in slate.

So while Microsoft is driving full steam ahead on preparing Windows Phone 7 to debut on smartphones by Christmas, I'd lay money that a skunkworks team is assessing the suitability of scaling the OS up for slates.



OPEN SOURCE CHALLENGE

Kubuntu 10.04

While the Gnome desktop is the de facto for Ubuntu, every milestone release also sees a KDE variant too.

APC EXPERT



ASHTON MILLS

Ashton has been using Linux since Slackware came on floppies, and before that he was one of the three people in the world who used OS/2 (and loved it). Always ready to make the most of his PCs, he is constantly playing with Linux distributions and compiling the latest kernel. This is his idea of fun, and why we get him to write for you.

KDE is an interesting beast: up to version 3.0 it competed with Gnome for the mind-share of Linux desktop users. KDE 3.0 was an excellent alternative, often favoured by the power users for its emphasis on configurability and flexibility.

For version 4.0, the KDE team took the drastic action of reinventing and rebuilding KDE almost from the ground up. This included redesigning the desktop paradigm and breaking functionality into core components that include Plasma (desktop display and effects), Phonon (multimedia backend) and Solid (hardware abstraction layer).

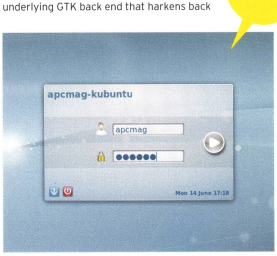
For its initial release, KDE 4.0 was buggy, lacked essential features, and most KDE applications weren't ready for it. In many ways, this set KDE back, for during this time Gnome continued to improve on its solid base. And I'll be the first to say that Gnome is reliable and works well as the first experience of Linux that most often accompanies users making a transition to Ubuntu.

But now at version 4.4, and with 4.5 on the way, I'll also be the first to say that KDE is rapidly leaving Gnome in the dust. The gamble to rework and redesign KDE at the height of its popularity is starting to pay off. Indeed while my current main desktop is Ubuntu 10.04, I'm now thinking that, come the 10.10 release, it might be Kubuntu greeting me in the morning.

WHAT'S SO DIFFERENT?

One of the reasons that KDE is starting to stand out is its underlying rendering architecture. While Gnome can look quite snazzy with 3D-accelerated effects thanks to Compiz, in many ways it's like putting lipstick on a penguin. Gnome still sports, after all these years, the same underlying GTK back end that harkens back to Windows 95 days. Compared to Windows 7 there's no Linux alternative to clean, fast, integrated desktop effects that ply their way through the environment from top to bottom. Except for KDE. The closest thing Linux has to the Windows 7 desktop in terms of functionality and eye candy lies firmly with KDE 4.0. You only need to browse the screenshots to get an idea.

But of course, a desktop environment is much more than how it looks. When it comes to day-to-day use, how does KDE compare to Gnome, and is it something you want to use?



The KDE login screen.

THE ANTI-DESKTOP

KDE's default view separates your desktop from the underlying filesystem and calls this an 'Activity'. You can elect it to display your Home folder, or any folder, as with Gnome, but by default objects on your desktop fall into one of three categories: widgets, folders and icons. In truth, the folders and icons are widgets too – in fact, the very paradigm of the KDE desktop is that (almost) *everything* is a configurable, moveable widget: the taskbar, the clock, folder views, documents and so on. Click on the clock and a calendar pops up, drag the pop-up into the desktop and it detaches as a separate widget. Interestingly, widgets can also be shared across a network – a system-monitoring widget can be loaded across the network to see the statistics of a remote computer.

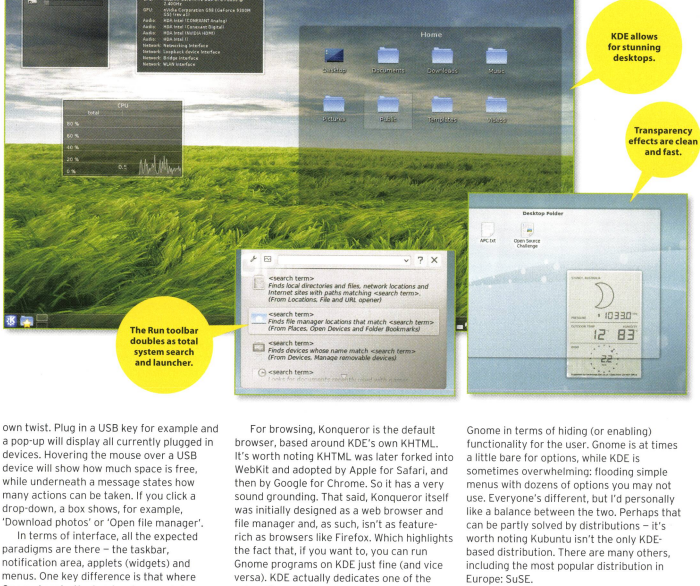
While filesystem management is managed by Dolphin (think Nautilus but – as is the way with KDE – with considerably more settings to play with), you can still move files and folders around on your desktop too – it's just that they represent links, not the objects themselves. And to organise these you have Folder Views. Imagine taking your current Gnome desktop and all the files and folders you use on it, and putting them onto the KDE desktop in a view called 'Desktop Folder'. Everything else on your desktop is there to help you work – or play – through the use of widgets.

And, as discrete graphical objects, all of them have at least some common functionality between them: to be configured, rotated, resized, launch parent applications – and of course remove them.

The only confusing thing is that not only can you have multiple 'desktops' as with Gnome, you can have multiple 'Activities', each of which can have multiple desktops. It's easy to get lost if you're not careful.

FUNCTIONALITY

The expected functionality of desktop integration, including the messenger (aka. Ubuntu popping up messages in the top right) is all there, but with KDE's



own twist. Plug in a USB key for example and a pop-up will display all currently plugged in devices. Hovering the mouse over a USB device will show how much space is free, while underneath a message states how many actions can be taken. If you click a drop-down, a box shows, for example, 'Download photos' or 'Open file manager'.

In terms of interface, all the expected paradigms are there – the taskbar, notification area, applets (widgets) and menus. One key difference is that where Gnome breaks the top-level menus into Applications, Places and System, KDE bundles this all under the K Menu, with 'Places' being found as 'Computer' on the K Menu, and System utilities being bundled under a System menu. While it does look better, I personally don't mind the breakdown under Gnome, it can save a few mouse clicks.

Many of the default apps, with the exception of graphics (where The Gimp dominates), are arguably better on KDE as well: Amarok is the best music player/manager on Linux by far, K3B is a brilliant CD/DVD mastering application, KTorrent is an excellent torrent client (which I used for many years on Gnome before finding Deluge), Kopete is a fully featured IM program, and even Dragon Player as the basic media player is a better tool than Totem under Gnome.

For browsing, Konqueror is the default browser, based around KDE's own KHTML. It's worth noting KHTML was later forked into WebKit and adopted by Apple for Safari, and then by Google for Chrome. So it has a very sound grounding. That said, Konqueror itself was initially designed as a web browser and file manager and, as such, isn't as feature-rich as browsers like Firefox. Which highlights the fact that, if you want to, you can run Gnome programs on KDE just fine (and vice versa). KDE actually dedicates one of the subsections under Appearance to how Gnome apps look under KDE.

While KDE is beautiful, I will say the default button theme is kind of bland, but this is easily replaced. In fact, most of the theme elements are easier to play with than under Gnome: for backgrounds, buttons, icons and more there is a 'Get new. . .' button that pulls in collections from the net and displays them with previews. Adding them is as simple as clicking on Install. This ease of getting new content applies to widgets too – you don't have to go hunting for them online and figure out how to install them; KDE does this for you. And there are *lots* to choose from.

IS IT ALL GOOD?

If there's a common criticism levied against KDE it's that it's the opposite to Gnome in terms of hiding (or enabling) functionality for the user. Gnome is at times a little bare for options, while KDE is sometimes overwhelming: flooding simple menus with dozens of options you may not use. Everyone's different, but I'd personally like a balance between the two. Perhaps that can be partly solved by distributions – it's worth noting Kubuntu isn't the only KDE-based distribution. There are many others, including the most popular distribution in Europe: SuSE.

Perhaps the biggest hurdle to KDE for Gnome users looking for a change is simply learning something new: the desktop paradigm, the different menus and the different default applications (though you can continue to use Gnome apps too).

But on the whole if you haven't considered KDE before, I do recommend giving it a go. Now that it's stabilised and into the polishing phase, it's pretty clear that Gnome will eventually be made obsolete – at least in its current incarnation. Microsoft made the visual jump from XP to Vista and now Windows 7. KDE made the same jump from KDE 3.0 to KDE 4.0. But it's clear that Gnome is living on borrowed time, unless it too undergoes a metamorphosis. Which it may just be doing (but more about that soon). LTUX

DISTORTION FIELD

Google services vs MobileMe

You don't have to fork out for Apple's MobileMe — Google offers most of the same functionality at no cost.

APC EXPERT



DAVID BRAUE

David Braue is *APC*'s newest columnist, who will be focusing on the Apple universe. He likes Apple, but got the gig because we think he can be objective.

Apple's MobileMe keeps your data in sync between devices, but it's not exactly cheap. A popular alternative is to use Google's online services, which make it a toddle to manage your email, contacts, and calendar across your Mac, iPhone, iPad, and any other device via the web. Forget about waiting until you physically plug in your devices to sync contacts and calendars: the future is all about instant syncing, anywhere.

EMAIL EVERYWHERE

The first thing you need is an email address on which to anchor your various Google services. If you don't already have a Gmail address, get one, or use Google Apps for Your Domain to set up a fully-managed, free email service for up to 50 users in any domain you own.

Once your email address is live, you can use Apple Mail to send and receive mail through Gmail from your desktop. In Gmail, click on Settings, then click Forwarding and POP/IMAP. Tick 'Enable POP for mail that arrives from now on' and decide what you want Gmail to do with downloaded messages. If you don't want to have to deal with them twice, choose 'archive Gmail's copy', which stores them permanently in Gmail but removes them from your Inbox. If you're going to be accessing your email from your mobile, make sure the Enable IMAP radio button is also selected.

To set up Apple Mail to use your Gmail account as its primary account, start it up and press Command+, to open Preferences, then click on 'Accounts' and the plus sign to add a new account. Type your name, Gmail address and password, then click Create. Apple Mail confirms your credentials, sets up your POP and IMAP services, then starts downloading your mail.

It is literally that easy to shift your email online. Google currently gives you over 7GB of storage per account – which is a heck of a lot of email – and you get access to its excellent, built-in spam filtering.

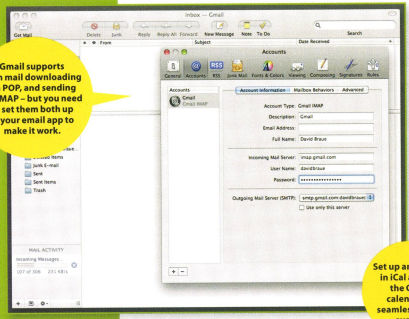
N.B. If you're not using Apple Mail, you can still set up the same services; Google provides POP (**bit.ly/cjC4M4**) and IMAP (**bit.ly/9idlbC**) configuration instructions so other email clients can access its non-standard, secured email services.

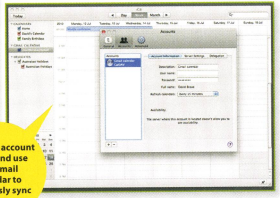
Setting up your iPhone and iPad to access your Gmail account is a breeze. Open Settings, then Mail, Contacts, Calendars and look under the Accounts menu. Tap Add Account then Gmail. Type in your Name, email address, password, and a description the device will use to refer to your account, and you're all set.

ONE SOURCE FOR DATES AND CONTACTS

With your email set up this way, you'll have a single place for all your email, which is available from your Mac desktop, smartphone and the web. That's just the start: getting organised becomes even more useful when you sync your contacts and calendars through Gmail as well.

You will have noticed the Contacts option on the left-hand side of the Gmail interface. Address Book now includes built-in syncing with that contact info, so it's easy to enable. Open Address Book, press Command+, to open Preferences, click on the Accounts tab and tick





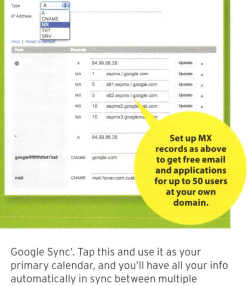
LET GOOGLE HANDLE YOUR DOMAIN

Domain name registrars usually charge an extra fee for email hosting or forwarding services, but Google Apps for Your Domain offers an excellent (and free) alternative. To use it, register your domain with your choice of registrar, then wait until the domain is active. Go to the Google Apps Standard Edition page (**bit.ly/LrTeL**) and click 'Get Started'. Choose the 'Administrator' option, enter your domain name and click 'Get Started'. Enter your contact details, then click through.

Google will ask you to set up a CNAME record to verify ownership of your domain. Copy the unique string of characters it gives you, then log into your domain registrar's control panel and look for the option that lets you control your domain's DNS settings.

At Hover.com, for example, this control panel is accessible by logging in and going to the Manage Domain > Manage DNS menu. Through this menu, you can set specific DNS records that control how various types of web traffic are routed. Select 'CNAME' from the pull-down menu, then paste the Google string into the Hostname box and type google.com as the Target Host. When Google tries to visit that site, it will get redirected to Google.com – confirming you have admin control over the domain.

To let Google manage your domain's email, look for and delete any MX (Mail eXchanger) records that are already set up. Then add five new MX records that redirect mail requests to Google's servers. Save your changes, then wait a little bit for the changes to spread throughout the DNS system, and your mail will automatically be routed to Google. Log into your domain at **www.google.com/a/yourdomain.com** and you'll go straight to your own inbox; you can also use the google.com/a control panel to add and modify privileges for up to 50 users per domain.



the 'Synchronize with Google' box. Click Configure, type in your details and you're set.

iCal works similarly for calendar syncing: open iCal, type Command+ to open Preferences, click on the Accounts tab, and click the + sign to add an account. Enter your details, leave the Account type as Automatic, click Continue and you should get another screen indicating an account of type CalDAV. Enter a name in Description, then leave the rest of the details alone and click Create. (N.B. If you haven't used Google Calendar before and iCal throws an error when trying to set up the account, log into Google Calendar – **www.google.com/calendar** – and create a dummy event to ensure CalDAV is set up; then retry adding your account).

All going well, you should see a new entry on the sidebar in iCal. Gmail won't sync the data in your existing calendars, but it will bring your Gmail calendar into iCal with every event tagged as being part of that calendar. You'll have to create any new events in that same Gmail calendar to have them automatically sync to Google, and then to your mobile devices or other desktops.

YOUR PHONE, YOUR DATA

Adding your iPhone, iPad or other phone to the mix requires a little more effort: Google exposes its calendar and contacts syncing services using Google Sync, which is basically a hosted Microsoft Exchange server, and communicates with devices using normal Exchange ActiveSync protocols (if you're using an email address managed by Google Apps for Your Domain, you must explicitly enable Google Sync through the administrator's control panel).

On your mobile device, open Settings – for Mail, Contacts, Calendars – and tap Add Account and Microsoft Exchange (If you have a different phone, check **bit.ly/94qbIN** for instructions). Enter your Gmail account details under 'username' and your password as indicated, but leave the Domain field empty. Press Next, and the system will bring up another screen requesting a Server name. Enter m.google.com, then press Next, and choose which services you want to sync – Mail, Calendar, and Contacts (since you've already set up mail syncing through the phone's normal channels, you can leave Mail unticked). If the device asks 'What would you like to do with existing local contacts on your iPhone', choose whether to keep or delete them, allowing your phone to be filled directly from Gmail.

You should now have an entry in your Mail, Contacts, Calendars screen called Google Sync; tap on it to set options. Once this is set up, tapping Calendars on your iPhone, iPad or other device will show an entry called 'Google Sync (Exchange)' and a calendar called 'All Google Sync'. Tap this and use it as your primary calendar, and you'll have all your info automatically in sync between multiple desktops or notebooks, smartphones and the web. The next time you open Contacts or Calendar, they'll fill up with your Gmail data.

FREE YOURSELF FROM MOBILEME

MobileMe offers a few other features, but free equivalents are not hard to find. Picture sharing is free via Facebook and Flickr – both of which are supported inside iPhoto – or Google Picasa Web Albums (**picasaweb.google.com**), which is not. Bookmark syncing is available via Firefox plug-ins such as GBookmarks (which accesses Google Bookmarks) or Delicious Bookmarks (which manages them via Delicious). Online file storage and sharing are handsomely managed via Dropbox, which can automatically publish web photo albums and comes in iPhone and iPad versions as well.

This leaves only MobileMe's Find My iPhone service to duplicate. Alternative iLocalis requires jailbreaking your iPhone, and Mobile Spy costs US$100 per year, at which point you might as well be buying MobileMe. iHound (**www.ihoundsoftware.com**), for one, offers a free app that will email you your iPhone or iPad's location whenever it's plugged into another computer. UTS

iPOD touch

Turn your iPod touch into an iPhone

Want to make and receive calls on your iPod touch? Read on.

APC EXPERT



JENNETH ORANTIA

An expert on all things mobile, Jenneth Orantia has been writing reviews and tutorials on smartphones for the last seven years. Her current phone of choice is the iPhone, but is also well versed on Android, Windows Mobile, Symbian and others.

A single click is all it takes to jailbreak the iPod Touch to get it ready for Skype set-up.

You can now buy an iPod touch for as cheap as $268 (for the 8GB version), which is exactly $451 cheaper than the entry-level 8GB iPhone 3G. For that small cost of admission, you get access to the iPhone's extensive selection of apps and games, can use the web browser, email and other online functions while you're at a Wi-Fi hotspot, and of course take advantage of the excellent iTunes integration for syncing multimedia and podcasts.

What you don't get, of course, is the phone functionality that comes with the more expensive iPhone. Or do you? If you're prepared to jump through a few hoops and spend a little bit extra, you can get a full functioning phone on your iPod touch that works over Wi-Fi.

The first thing you'll need to do is install Skype on your iPod touch. Since the touch doesn't have a microphone built-in, you'll also need headphones with a built-in headset – the Apple Earphones with Remote and Mic, which you can buy from the Apple store for $39, work perfectly. Unfortunately, a Bluetooth headset won't work – while the iPod touch supports A2DP for connecting to Bluetooth headphones, it doesn't support the requisite Headset Profile.

You've now got everything you need for making and receiving Skype calls over a Wi-Fi connection *while the Skype application is active*. But if you switch to another application or your iPod touch goes to sleep, you'll be disconnected from Skype – hardly ideal if you want to use it for incoming calls as well.

The next step, then, is to jailbreak your iPod touch so you can run programs in the background. Lucky for you, jailbreaking has just gotten a hell of a lot easier with the release of the Spirit jailbreak (**http://spiritjb.com**), which works for iPod touches running OS 3.1.3.

Like Quickpwn, this doesn't reformat your device, so you won't have to reinstall all of your apps and re-transfer all of your multimedia after running it. It's also extremely quick – we were able to jailbreak our iPod touch in under a minute.

After running Spirit and your iPod touch has restarted, you'll see a new app icon on the springboard called Cydia. Open Cydia, tap on the Search tab at the bottom of the screen and enter 'Backgrounder' into the search field. This is the magic utility that will let you run Skype in the background so you can receive incoming calls when the app itself isn't active. Click the install button on the right-hand-side and wait for the installer to finish.

The last issue to tackle is where the iPod touch turns off Wi-Fi every time the screen turns off. If you want to run your iPod touch as a phone, you'll want to keep the Wi-Fi on continually. Go back to the Search tab in Cydia and enter 'Insomnia'; this app will keep your Wi-Fi connection active even after your iPod touch has gone to sleep (hence the name).

Once Insomnia has installed, go back to the iPod's springboard and launch the new Backgrounder app. Go to Application-specific > Always-enabled and put a tick next to Skype. Skype will now run in the background once you've opened it the first time. From here, all you'll need to do is buy some Skype credit for making outgoing calls, as well as buy a SkypeIn number if you want people to be able to call you. If you want to be able to use Skype from anywhere (rather than being tied to Wi-Fi networks), you can use the Internode MiFi ($349, any carrier) or the Virgin Mobile Wi-Fi modem ($199, postpaid and prepaid Virgin Mobile data plans). ATTIC



CONVERSION

Rip Flash videos

Many sites enable you to download Flash-based videos. **Joe Cassels** shows you how to convert them to a useful format.

More and more web sites are providing streaming Flash videos. Some sites let you download them, others don't. But it's usually possible to retrieve the files from your cache and rename them with the FLV extension to make them playable. This is fiddly and there are few players that natively support FLV files. Ripping and converting Flash videos can be useful, especially if you've uploaded a movie to YouTube and then lost the source file. Downloading video from Flash-based sites is easiest if you install a video-downloading extension in Firefox or Chrome. There are several available, but they generally work by providing a download link for the video and enabling you to save it as an FLV file. If you want to perform any editing or put the video on a DVD, phone or other device, you'll need to convert it to another format. There are several conversion programs available, but Avidemux is open source, relatively easy to use and provides various editing and video processing options.

APC EXPERT



JOE CASSELS

A former network manager, Joe has been writing about PCs for nearly a decade.

6 STEPS GRAB FLASH VIDEOS FROM THE WEB

Fancy saving a video in case its owner deletes it from YouTube?







1 FIND YOUR VIDEO

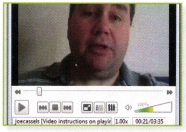
Browse to the video you want to capture. People often share videos in emails and on social networks, but the option to download them for offline playback isn't readily available in these cases.

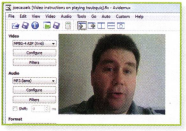
2 DOWNLOAD AN EXTENSION

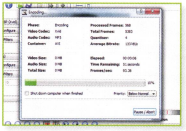
You can unlock the ability to download videos using a browser add-on. Easy YouTube Video Downloader does the job (**bit.ly/5x5PI**). There's also a Chrome version at **bit.ly/6NChbx**.

3 CLICK 'DOWNLOAD'

Once you have the extension installed, you'll see 'Download' buttons below the video you're after. If available, opt to download in MP4 format because it works with most media players.







4 PLAY YOUR FLV VIDEO

If you could only download a FLV file, you can play it back with a compatible player. VLC Media Player (**bit.ly/11GMdD**) plays FLV files. If you want to edit the file, you'll need to convert it.

5 DOWNLOAD AVIDEMUX

Download and install the program Avidemux from **bit.ly/5W05LO**. Choose 'File > Open' and browse to the FLV file. Click 'Open' to see it displayed. Under Video, choose 'MPEG-4 ASP (Xvid)'.

6 CONVERT THE VIDEO

Under Audio, choose 'MP3 (lame)'. Choose 'File > Save > Save Video' and provide a filename and save location for the new file. Click 'Save' to begin the conversion.

WINDOWS

Find and fix PC problems with ease

Mike Williams shows you how to monitor changes to your PC's Registry, filesystem and drivers with System State Analyzer.

WHAT YOU'LL NEED

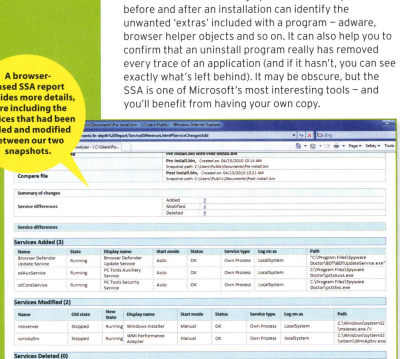
SYSTEM STATE ANALYZER

This official Microsoft tool keeps a deep watch on your system's most intricate movements. Grab the latest version from *bit.ly/bteiFC*.

You've installed a new application, but found another program has stopped working. When you uninstall the troublesome app, everything goes back to normal. Clearly there's some kind of conflict. But where? Diagnosing problems like this can be difficult, because there are so many possibilities. Don't give up, though: there's a free tool that could provide all the answers.

Windows' System State Analyzer is a little-known Microsoft program that, in a few clicks, will take snapshots of your PC, then let you compare two and display the differences. Use it in a situation like this and you'll discover exactly the information you need to diagnose conflicts.

But that's not all. Using System State Analyzer (SSA) before and after an installation can identify the unwanted 'extras' included with a program – adware, browser helper objects and so on. It can also help you to confirm that an uninstall program really has removed every trace of an application (and if it hasn't, you can see exactly what's left behind). It may be obscure, but the SSA is one of Microsoft's most interesting tools – and you'll benefit from having your own copy.



A browser-based SSA report provides more details, here including the services that had been added and modified between our two snapshots.

SET UP THE PROGRAM

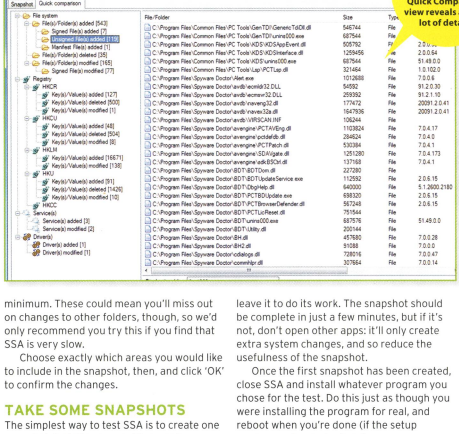
Windows SSA is included in Microsoft's Software Certification Toolkit, which as you might guess, isn't aimed at the average home PC user. It's not easy to find, either, but if you point your browser at the Windows Server 2008 pages (**bit.ly/bteiFC**) and look down the page, you'll find a 'Certification Test Tool' heading. Below that are download links for both the 32-bit and 64-bit toolkits, both of which will run on Windows 7, Vista and Server 2008. Grab the one you need and install it with the default settings.

After you've downloaded the toolkit, click 'Start', type 'windows system' and click the 'Windows System State Analyzer' link to launch the program. It works by creating a snapshot of your PC – something that completely describes its files, Registry keys, services and drivers. It's usually a surprisingly quick process, taking around three minutes on an uncluttered, high-end PC. If you have an older system, though, we found analysis could take an hour or more, so if you're just taking a snapshot for the purposes of assessing a regular program installation, it might be worth restricting the details you ask the SSA to examine. Click 'Tools > Options', select all drives other than the system partition (assuming that's where the program will be installed) and click 'Remove'.

In extreme cases, you could also remove your system partition, then restore just a specific folder. Adding just C:\Windows, for instance, would record any changes in that and any other subfolders, but cut your scan time to a

VISTA WOES

The SSA refused to work on one of our Vista test PCs, for reasons we never figured out. If it hangs at the initial 10 per cent on your PC, for a very long time, ie 30 minutes or more, cancel the snapshot, remove all but one Registry hive from the snapshot and try again. If it still hangs then it looks like the program won't work for you. Try again if you upgrade Windows, though — our Windows 7 tests worked perfectly.



Missed a tutorial?

Go to apcmag.com or www.magshop.com.au for back issues of APC

SECURE SNAPSHOTS

If you like the SSA snapshot idea but are more interested in using it from a security point of view, take a look at the free ESET SysInspector (**www.eset.com/download/sysinspector**). This can establish a system baseline containing details on processes, Registry content, startup programs and more. Entries are highlighted according to their security risk, there's technology to help you to uncover rootkits, and later snapshots may be compared to show changes over time.

minimum. These could mean you'll miss out on changes to other folders, though, so we'd only recommend you try this if you find that SSA is very slow.

Choose exactly which areas you would like to include in the snapshot, then, and click 'OK' to confirm the changes.

TAKE SOME SNAPSHOTS

The simplest way to test SSA is to create one snapshot, install a reasonably complex program, create a second snapshot and then compare them both. Our recommendation would be a security tool, something like PC Tools Spyware Doctor (**bit.ly/cmHFnM**) – a program that will install drivers and services and generally give you an interesting report.

Download whatever application you intend to install, then close your browser and any other programs you might have running. Once your system is suitably free of active programs, switch back to SSA and click the 'Start' button in the left-hand pane. Then just leave it to do its work. The snapshot should be complete in just a few minutes, but if it's not, don't open other apps: it'll only create extra system changes, and so reduce the usefulness of the snapshot.

Once the first snapshot has been created, close SSA and install whatever program you chose for the test. Do this just as though you were installing the program for real, and reboot when you're done (if the setup program asks you to do so).

Finally, reload the SSA and click the 'Start' button in the right-hand pane to create the second snapshot. It'll take roughly the same amount of time as the first.

PRODUCE SOME RESULTS

Once the SSA reports that it's finished the second scan you might be tempted to click the Quick Comparison tab to examine the results. However, some poor interface design means you can select the tab before it's actually been populated with anything useful; what you have to do is click the 'Compare' button, then wait as SSA itemises the differences.

The comparison process, in our experience, doesn't take long. You'll also be asked if you want to create a detailed report. Click 'Yes', point the program at the folder where you'd like to save the report, and name it. Then wait while the report is generated.

More dubious interface design means that SSA will now appear to have locked up. Don't worry, though – the program hasn't crashed, it's just busy working on the report. Eventually a window will appear and you'll finally be able to see exactly what's changed between the two snapshots.

READ THE REPORTS

Minimise the HTML report for the moment and click the Quick Comparison tab for an instant look at how your PC setup has changed. You'll immediately see just how useful SSA can be.

SPOTLIGHT ON... ALTERNATIVES TO SSA

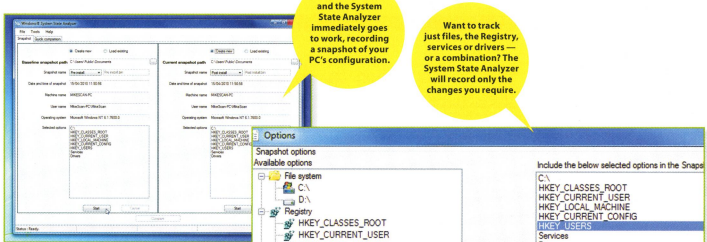
The Windows System State Analyzer is able to take snapshots of your system state, compare them and display the differences. It can't do anything else with this information, though, which in some ways is a shame — plus, other programs take the concept further.

Total Uninstall (**www.martau.com**), for instance, will take a snapshot of your PC before you install a program — and another immediately afterwards. It's able to display a helpfully complete view of the files and Registry keys that the setup program has added or changed.

Most importantly, it can reverse those changes whenever you like, removing the program entirely, with none of the junk regularly left behind by standard uninstallers.

The program isn't alone: Registry Watch (**www.easydesksoftware.com**) does a similar job, and despite its name, it monitors the filesystem as well. It also proved pretty speedy in our tests, and unusually works on every version of Windows, from the venerable 95 to the latest 7 release.





Our Spyware Doctor test comparison, for example, revealed that the program had added three services to our PC's configuration, and told us all about them. The program had also added a kernel driver to our PC, and it had also modified another driver, Winsock IFS, in order to intercept network traffic. That's expected and completely acceptable for a security tool, but if you were monitoring a simpler installation and noticed it did this, that should raise an alert.

You're also able to view the files that have been added to your PC (signed, unsigned and any manifests), along with any that have been deleted or modified. This is generally less useful than you'd expect, as it's cluttered with temporary files created during setup.

And of course you can also browse new, deleted or modified Registry keys in each hive ('HKEY_CURRENT_USER', 'HKEY_LOCAL_MACHINE', and so on). Again, there's a lot of setup-related details that won't mean a lot, but fortunately the list is sorted by key name, so you can scroll through the less useful information in seconds.

GO MORE IN-DEPTH

While the Quick Comparison view generally works well, you will occasionally run into problems. In our Spyware Doctor test, for instance, we noticed that the SSA was reporting more than 16,000 additions to the 'HKEY_LOCAL_ MACHINE' Registry hive. Yes, really – 16,000. And to make it even worse, Quick Comparison only lets you view this in blocks of 1,000 keys, so navigating the full list is tedious in the extreme. Fortunately there's an easy answer when you run into such limitations: switch to the browser-based detailed report that you created earlier. (Or, if you didn't, click the 'Detailed Report' button in the Quick Comparison window.)

This version of the report contains everything you've seen so far but also breaks the changes down even further. Instead of simply detailing new, modified or deleted files, it now splits the list into sections dealing with DLLs, executables, drivers and more.

And in other sections, if you're unlucky enough to have tens of thousands of entries to examine, they're all available on a single web page, allowing you to scroll down the list, or search for particular text to jump straight to the entry you need.

The Windows SSA is far from perfect, then. It's on the slow side, the interface needs work, and we found it hung occasionally on one Vista system for no apparent reason. But on the other hand, it's free, easy to use and delivers invaluable diagnostic reports on how your PC setup has changed over time, information you can't easily obtain in any other way. You certainly won't use it on a daily basis, but the SSA is still a very useful tool on occasion, and should be a key part of everyone's PC troubleshooting toolkit.

DO THIS... AUTOMATE WINDOWS' SYSTEM STATE ANALYZER

The ability to take and compare system snapshots is extremely useful, and something you could use on a regular basis. For example, you might take a snap of the HKEY_LOCAL_MACHINE and HKEY_ CURRENT_ USER Registry hives before you install any program from now on, just as a matter of course. If there are problems later then you'll be able to take a second snapshot, compare the two and look at what's changed.

Of course, if you're going to run the SSA all the time then you'll want to make the process as quick and easy as possible — and there's no simpler solution than using the program's command-line switches. Learn what's on offer and you'll be able to define the areas to scan, save a snapshot and produce a comparison report, all in one or two batch files, scripts or shortcuts.

To create a snapshot, enter the command 'SAnalyzer.exe Create [OutputFile] [Options]'. To base a snapshot of the two main Registry keys, for instance, you might try 'SAnalyzer.exe Create c:\regsnap.bin /R HKCU; HKLM'. Easy.

Take two of these (using different names) and you can then compare them from the command line, too, using the command 'Sanalyzer Compare [file1] [file2] [Compare Options] [Output file]'. The options here let you compare only specific data in a snapshot — just the files, say — but normally you'd use the /A switch to compare everything.

It's all reasonably straightforward, then, and you can have snapshot creation and comparison automated in minutes. All you really need are the specific command-line options, and you'll find them in the 'ReadMe.htm' file, located in your C:\Program Files\Microsoft Logo\Software Certification Toolkit\Windows System State Analyzer folder.



CODE CRACKING

Learn how to crack ciphers

Mike Bedford looks at the history of cryptology — and creates a few codes while he's at it.

WHAT YOU'LL NEED

CIPHER EXCEL WORKBOOKS 1 TO 3

These Excel workbooks are available at *apcmag.com/workshops*. They implement the various methods of encoding and cracking encrypted messages that we discuss in this article. However, if you create them yourself, you'll learn more.

Ciphers have been a mainstay of military espionage for centuries, and today they're essential to e-commerce. We'll take a look at the development of ciphers from the earliest times to the present day. This is a hands-on guide in which we'll use Excel workbooks that you can create yourself, plus online utilities.

THE CAESAR CIPHER

The first use of a cipher is often attributed to Julius Caesar back in the first century BC. The scheme is simplicity itself: each letter is encrypted by moving forward a fixed number of places in the alphabet, wrapping back to the start when you reach the end. So, for a shift of three – the value used by Caesar – A becomes D, B becomes E and so on. A Caesar Cipher with a shift of 13 is useful (yet weak) because the same process used to generate the code can be used to translate it back.

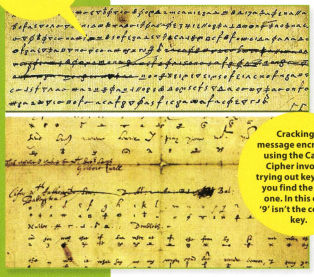
We're going to create an Excel workbook to encrypt messages (and later decrypt them) using the Caesar Cipher, but if you want to take a short cut you'll find the finished workbook, 'Cipher-1.xls', at **apcmag.com/workshops**. Start with a workbook comprising four worksheets, and rename them Encrypt, Decrypt, Concatenate-E and Concatenate-D. Next put a suitable title in cell A1 of the Encrypt worksheet, and add the labels Key:, Plaintext: and Cyphertext: to cells A3, A4 and A5. Now, in cell B3 insert the number 3, which is our key. This specifies that the shift will be three places in the alphabet – see the 'What makes a good cipher?' boxout for more.

Prior to encryption, text is called plaintext. So, enter some plaintext for encryption in cell B4, but make sure you do so in the following way. First, use only upper-case alphabetic characters (no lower-case letters, numbers or punctuation) and second, enter the text in groups of five characters with spaces between. The restriction on upper-case letters applied to early ciphers but is not an issue for today's state-of-the-art ciphers. The use of five-letter groups (again not needed in modern ciphers) was applied to hide information that could be gleaned from word lengths. For example, if the plaintext was spaced normally, a single-letter word would almost certainly be an 'a' or 'I', and a commonly occurring three-letter word would probably be 'the'.

TERMINOLOGY

This article uses several words that might not be totally familiar to you. The science of making and breaking codes or ciphers is 'cryptology'. This divides into 'cryptography', which is the devising of ciphers, and 'cryptanalysis', which is the process of cracking them.

Ciphers have a very long history, as these manuscripts show.



Cracking a message encrypted using the Caesar Cipher involves trying out keys until you find the right one. In this case, '9' isn't the correct key.

	A	B	C	D	E
1	*Caesar Cipher Decryption Utility*				
2					
3	Key:	9			
4	Ciphertext:	XLPCS TGTSA DCTAN PHPRA DJSIW P			
5	Plaintext:	OCGTJ KXKJR UTKRE GYGIR UAJZN G			
	equence lumber	Letter in Ciphertext	Number of Ciphertext Letter	Number of Plaintext Letter	Letter i Plainte
9	1	X	23	14	O
9	2	L	11	2	C
10	3	P	15	6	G
11	4	C	2	19	T

MAKE A TRANSPOSITION CIPHER

In the rest of this article, all the ciphers we've seen involve substituting one letter for another. An alternative approach is transposing the letters (in other words, mixing them up according to a particular rule).

A simple example is the columnar transposition cipher — here's how it works. Write the plaintext in rows of a predetermined fixed length. So, if the length were six and the message was 'GET READY WE ATTACK AT TWELVE', it would be formatted like this.

```
GETREA
DYWEAT
TACKAT
TWELVE
```

The ciphertext is read out in columns in the order specified by the key, each key being a mix of the numbers 1 to 6. So, if the key were 512364, the ciphertext would be 'EAV GDTT EYAW TWCE ATTE REKL' or 'EAAVG DTTEY AWTWC EATTE REKL' in the familiar five-letter groups. Why don't you try your hand at creating an Excel workbook to do this? If you get stuck, look at 'Cipher-3.xls'.

Although we've entered the plaintext as a string, we'll need the individual letters to encrypt it. In A7, enter the column heading Letter Sequence Number, and in B7, the heading Letter in Plaintext. Enter 1 into A8 and =A8+1 into A9, then copy that down to A1007. Now, to extract the first letter from the plaintext, enter =MID (B4,A8,1) into B8 and you'll see the first letter appear. Copy down to B1007 to see each of the letters in the plaintext running down column B.

Next we need to convert the letters to numbers, so enter the column heading Number of Plaintext Letter in C7, put the heading =IF(B8=" ","",CODE (B8)-65) in C8, and copy down. The IF ensures that we don't try to encrypt the spaces, the CODE function returns each letter's internal code (ASCII), and since the ASCII codes for A to Z are 65 to 90, we subtract 65 to end up with numbers in the range 0 to 25. You'll see these running down column C (it will show '#VALUE!' after the end of the plaintext).

Now it's time to encrypt the letter values, so enter the column heading Number of Ciphertext Letter in D7 and =IF(B8=" ","
",MOD(C8+B3,26)) in D8 and copy down. This formula adds the key to the plaintext value and uses the MOD function to wrap round at the end. Finally, to turn the codes to letters, add the column heading Letter in Ciphertext to E7 and =IF(A8<=LEN(B4), IF(B8=" "," ",CHAR(D8+65)),"") to E8, again copying down. The CHAR function is the opposite to the CODE function, turning an ASCII code into a character, and the first IF statement is to ensure we don't get '#VALUE' after the end of the text.

Although you can read the ciphertext down column E, it would be far better to join all the letters together to produce a text string we can read normally. This is where the Concatenate-E worksheet comes in. Put a title in rows 1 and 2 if you want. Then, in A4, enter =Encrypt!E8 and the top letter in column E from the 'Encrypt' worksheet will appear. Now, in A5, enter =A4&Encrypt !E9 and copy down to A1004. Finally, back in the Encrypt worksheet enter ='Concatenate-E'!A1004 into B5 and the ciphertext will appear in all its glory. If you make sure you use a fixed width font for B4 and B5, the plaintext and the ciphertext will line up so you can see what each letter has become.

REVERSING THE PROCESS

Converting the ciphertext back to plaintext can be done in two ways: the easy way, by someone who knows the key, or the hard way, by someone who doesn't. I'll leave you to figure out the easy way (unless you're using Cipher-1.xls from **apcmag.com/workshops**, and so know already). To get you started, the Decrypt worksheet will be similar to the Encrypt one, and likewise Concatenate-D will be similar to Concatenate-E, the biggest difference being that you subtract the key from the ciphertext to generate the plaintext. Try it out with the following ciphertext:

```
XLPCS TGTSA DCTAN PHPRA
DJSIW PIUAD PIHDC WXVWD
TGKPA THPCS WXAAH
```

If you knew the key, you'd simply enter the ciphertext and the key into the Decrypt worksheet to see the plaintext. But we're not going to tell you the key, so we're putting you in the place of the cryptanalyst to break the code. Try out possible keys, working up from 1, until you find one that works.

ALPHABETIC SUBSTITUTION

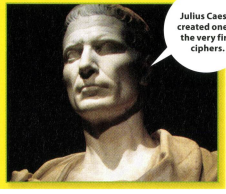
The process of cracking the Caesar Cipher illustrates how trivially simple it is when there are only 25 possible keys to try out. The obvious way to make it harder is to increase the number of keys. The Caesar Cipher is a special case of a so-called Monoalphabetic substitution cipher. In the more general case, any letter of the alphabet can translate into any other letter of the alphabet – not necessarily the one shifted by a fixed number of places in the alphabet. So the key could now be ECYLHURAVOKXSFZQGW BTNMIJPD, which means that A becomes E, B becomes C, D becomes Y and so on. Since there are 26 factorial ways to order the 26 letters of the alphabet (26 x 25 x 24 x 23 x 22 x . . .), the number of keys is equal to 403,291,461,126, 605,635,584,000,000 – so you might expect it to be far from trivial to crack this cipher. But although the brute-force method of cracking this cipher is out of the question, there is a simpler method, as we're about to see.

WHAT MAKES A GOOD CIPHER

The Caesar Cipher has only 25 possible keys. So if you know a message has been encrypted using that particular cipher, it's trivially simple to crack the code by trying out each possible key in turn. Such a method is referred to as the 'brute-force' approach.

The general mono-alphabetic substitution cipher has 403,291,461,126,605,635,584,000,0 00 possible keys. If you used a supercomputer to try out one billion keys per second, in each case analysing the result to see if it comprises words of the English language, it would take about 12 billion years to crack the code. This would rather suggest that the mono-alphabetic substitution cipher is virtually impenetrable, but really it's still vulnerable to other methods (see main article).

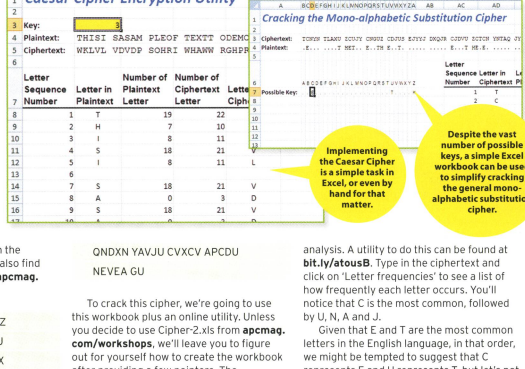
Cryptologists consider that a good cipher is one in which the brute-force method is the easiest method of cryptanalysis. It is thought that all the ciphers that are in serious use today fall into this category.



Julius Caesar created one of the very first ciphers.

CODES & CIPHERS

Here we've used the words 'code' and 'cipher' interchangeably, but this isn't strictly accurate. This article is about ciphers, which involve working on individual letters. Codes involve making substitutions at a word-by-word or phrase-by-phrase level. Today codes are rarely used for secrecy, but they are sometimes used in radio communication (so '10-4' means 'Roger, understood').



We're going to be working with the following ciphertext, which you'll also find in the workbook 'Cipher-2.xls' at **apcmag.com/workshops**.

TCNYN TLAXU ZCUJY CNGUZ
CDJUS EJYYJ DXQJR CJDVU
ZCTCN YNTAQ JYPJR AXAUX
KSADU CXXCD QCJUG AEXUT
YJDQC AUAYY SUEJU CXUZC
YJDVH CDCJU ZUZCX NAYHS
ULAUZ XNPCC FUEJQ NDXAV
CEJUA NDAUL AYYLA CYVJU
ZECCV APCDX ANDJY BACLN
GUZCX UESQU SECNG UZCSR
RCEPN XUQES XUNGU ZCCJE
UZNGU ZCECY JUAND XZARN
GNDCE NQIGN EPJUA NDUNJ
DNYAV TCNYN TLHCY NLAUX
QNDQC JYADT PJDUY CNGSD
QNDXN YAVJU CVXCV APCDU
NEVEA GU

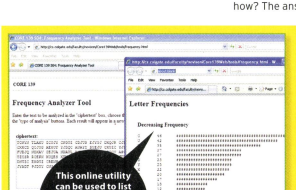
To crack this cipher, we're going to use this workbook plus an online utility. Unless you decide to use Cipher-2.xls from **apcmag.com/workshops**, we'll leave you to figure out for yourself how to create the workbook after providing a few pointers. The screenshot shows what we're aiming for, and the columns AC and AD are very similar to columns A and B in Cipher-1.xls. This time, though, we're going to be working purely with letters, so we don't need to convert them to numeric codes.

The alphabet in its normal order appears in cells B6 to AA6, and a guess at the key appears directly below it in cells B7 to AA7. All these cells contain a full stop at the moment: you'll fill them in as you progress. The only other thing you need to know is that column AE uses the LOOKUP function to take a ciphertext letter from column AD, look it up in cells B6 to AA6 and replace it with the guess at the plaintext letter from cells B6 to AA6.

We've referred to guessing which plaintext letter each ciphertext letter represents, but how? The answer is to use frequency analysis. A utility to do this can be found at **bit.ly/atousB**. Type in the ciphertext and click on 'Letter frequencies' to see a list of how frequently each letter occurs. You'll notice that C is the most common, followed by U, N, A and J.

Given that E and T are the most common letters in the English language, in that order, we might be tempted to suggest that C represents E and U represents T, but let's not jump to conclusions. Instead, go back to the utility and this time click on 'Digraph frequencies'. You'll get an ordered list of the frequency of letter pairs, and you'll see that UZ, ZC, JU and NG are the most common. We know that TH, HE, AN and RE are the most frequent letter pairs in English, so it rather looks like our initial guess was correct, and also that Z probably represents H.

We can now enter these guesses into the workbook. Immediately, some of the dots that represented the plaintext are changed into Es, Ts and Hs. We'll leave you to complete this exercise – you'll find frequency lists for letter digraphs and trigraphs online. Bear in mind that unless you have thousands of characters of ciphertext, the frequencies won't be identical to that of the English in general, so you'll have to do some detective work.



MAKE A POLY-ALPHABETIC CIPHER

The reason that the mono-alphabetic substation cipher is so easy to crack is that frequency analysis of letters and letter pairs can be used. So the next step in the development of ciphers involved ensuring that the ciphertext couldn't easily be analysed in this way. This was done by having more than one key and cycling through them to create a poly-alphabetic substitution cipher.

Simple frequency analysis reveals no information that could be used to crack the code. You might like to develop an Excel workbook to implement such a scheme, using similar principles to those we saw for encrypting the general mono-alphabetic ciphers.

Despite its apparently complexity, the poly-alphabetic substitution cipher can be cracked in a similar way to the mono-alphabetic one, even though it's a more time-consuming process.

NETWORK

Create your own proxy server

Jon Thompson shows you how to access cached pages quickly, block web sites and protect your network from malware.

WHAT YOU'LL NEED

FREEPROXY

FreeProxy is a free and comprehensive general-purpose proxy server. It's fully featured, and did we mention that it's free? Because it is. And that's great. Grab it from *bit.ly/bnXcGC*.

Corporate networks always have proxy servers, while on home networks they're often an overlooked form of defence. But maybe they shouldn't be. A local proxy server can help to improve the throughput of your broadband connection, restore order to a troubled network and add another line of defence against malware infections.

WHAT ARE PROXIES?

'Proxy' means substitute. To the computers on the local network, a proxy server is a substitute for connecting directly to the web.

There are several different types of proxy server. For example, a web proxy server keeps copies of recently accessed web pages on your hard disk. When you access a page, the proxy serves the cached version if it's up to date. This is faster than downloading static files from the site.

All internal computers must use the local web proxy server for it to be effective. In the settings for your web browser, there's a page to point it at a proxy server rather than the network's default gateway. This gateway is usually a router or the computer attached to your broadband modem.

Some proxy servers also block content, especially on corporate networks. You may be tempted to disable the proxy settings in your browser to view sites your boss would rather you didn't during work hours. However, to ensure that everyone on the network uses the proxy to access the internet, system administrators block all access to the internet at their firewall, except traffic coming from or going to the proxy. So to access anything outside the local network, you must use the proxy.

Forcing everyone to use the proxy gives system administrators great control over what their users can access. The same principle can be used at home by parents and those simply keen to bolster security. If you find unexpected access attempts in a firewall's log file from inside a proxy-protected network, they're probably coming from malware that doesn't know how to test for a local proxy and has tried to go directly online.

INSTALLING FREEPROXY

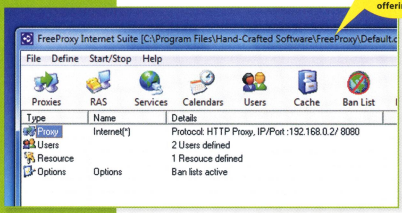
FreeProxy (or FreeProxy Internet Suite) is a free Windows-based proxy server that can provide web caching for faster access and is able to block banned web domains. It works on Windows 7 and should ideally run on its own computer. The app is available for free from **bit.ly/bnXcGC**.

Once downloaded, unzip the file and double-click on the setup application. When the installation wizard appears, click 'Next' to accept the licence agreement, the default destination folder and Start menu folder, then click 'Install'. When the release notes pop up, click 'Next' then 'Finish'.

Click Start and select 'FreeProxy Control Centre'. Let's begin by configuring and testing FreeProxy for basic use.

Open a command line and enter 'ipconfig'. Press Enter and one or more blocks of information will appear. Find the one about the server's Ethernet connection (usually the first

FreeProxy is deceptively simple to use, but it contains advanced features that you would expect to find in a commercial offering.



RESOURCES

The latest version of FreeProxy Internet Suite is available for download at: **bit.ly/bnXcGC**.

Proxyway is another free proxy utility (**www.proxyway.com**), while EzProxy is a commercial alternative that offers a 15-day evaluation licence (**www.easyproxy.com/**).

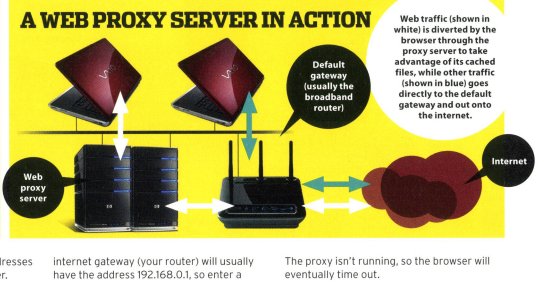
The free Squid proxy comes with many Linux distros, and is available here: **www.squid-cache.org**.

You can read more about how anonymous proxy servers help to keep you safe on the web at: **bit.ly/hcafpa** and **bit.ly/tpiyr**.

PROXY SECURITY

To prevent anyone unscrupulous accessing the FreeProxy Control Centre and disabling the settings, your first job is to set an access password. Click 'Define > Set Control Centre Password'. Enter and confirm a password, and the next time you run FreeProxy you'll be asked to enter the password. If you need to remove the password again, go back into 'Define > Set Control Centre Password' and leave the fields empty.

A WEB PROXY SERVER IN ACTION



one that appears) and note the IP addresses of the default gateway and DNS server.

First, we need to stop relying on DHCP to provide IP addresses on demand and use a fixed address instead. This is so other computers on the network can find the proxy server via its address. In Windows 7 or Vista, open the Control Panel and click 'Network and Internet > Network and Sharing Centre'.

In Windows 7, click 'Change Adaptor Settings' in the left-hand pane and double-click the 'Local Area Connection'. In Vista, click on 'Manage network connections' and double-click on the 'Local Area Connection'. In XP's Control Panel, double-click 'Network Connections' and then double-click the 'Local Area Connection'.

Click 'Properties' and a window will appear showing the underlying configuration. Double-click the entry in the protocol list called 'Internet Protocol Version 4 (TVP/Ipv4)'. In XP this is just called 'Internet Protocol (TCP/IP)'.

Another subwindow will appear, giving details on how the computer gets its IP address. Click the radio button marked 'Use the following IP address'. Your default internet gateway (your router) will usually have the address 192.168.0.1, so enter a different number in the fourth position (192.168.0.2, for example). If you're not sure if this address is already in use, open a command line and enter 'ping 192.168.0.2'. If the command hangs and then returns a set of timeouts, the address isn't in use.

Next, enter a subnet mask of 255.255.255.0 and the IP address of your default gateway in the appropriate input boxes. Select the 'Use the following DNS server addresses' radio button and enter the IP address of the DNS server you noted down earlier. This is probably the same device as the default gateway. Click 'OK' and dismiss the parent windows.

Now we need to make a web browser use the proxy server to access the internet. On a different networked machine, open Internet Explorer 8 and click 'Tools > Internet Options'. Click 'LAN settings' in the Connections tab. In the subwindow, select the tickbox labelled 'Use a proxy server for your LAN'. Enter the address 192.168.0.2 and change the port number to 8080. Now click 'OK' and dismiss the parent window, then try to surf to a page. The proxy isn't running, so the browser will eventually time out.

In the FreeProxy Control Centre, click the 'Start/Stop' button and a window will appear. To start the proxy server, click the 'Start' button in the Console Mode pane at the bottom. Windows Firewall may pop up to tell you that it's blocked the program. Ensure that the option to allow FreeProxy to communicate on your home network is selected and click 'Allow Access'. Refresh the page in the browser by pressing F5. It should now load properly.

BLOCKING WEB SITES

Proxy servers are often used to block content, and FreeProxy does this admirably via ban lists. Click 'Ban Lists' on the FreeProxy Control Centre and the Ban List Manager will appear. Click 'New'.

Ban lists are split into several categories. Click 'Add' to add a category and a window will appear. Enter a name like Do Not Access. You can define an action the proxy must take when a user tries to access one of the URLs in the category, such as redirecting the user to an external URL or showing a custom error

DO THIS... USE A PUBLIC PROXY

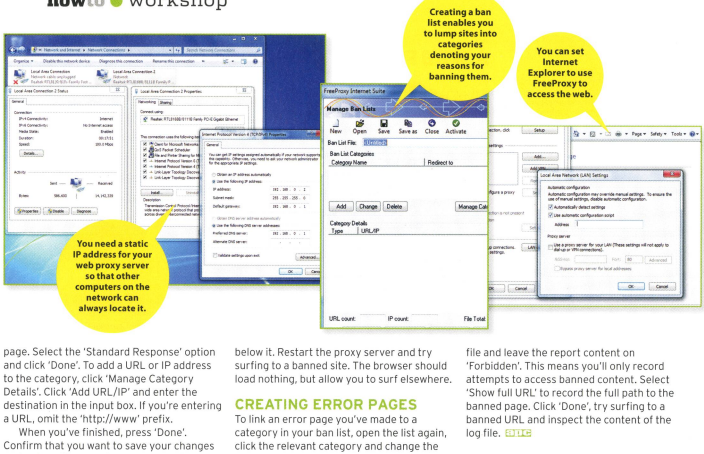
You can sometimes catch a peek at your favourite imported shows before they're shown on local TV by using a public proxy server. Like a local proxy server, a public proxy makes your web presence seem as if it's coming from somewhere other than your computer. This is all a public proxy does – it makes you appear to be in another location. That's useful because media servers that block content by region will serve you content meant for the region in which the proxy resides.

When you reach a page that you can't access because you're not in the right country, copy the URL, go to **www.publicproxyservers.com** and click the 'Proxy List' link. In the resulting list, which is around 14 pages long, you'll find public proxy servers from all over the world.

To pick one in the region that interests you, click the Country heading to sort the list in alphabetical order. Scroll down, looking for a server with as close to a 100 per cent rating as possible.

When you find a suitable proxy, click on its link. Enter the URL you copied earlier into the address bar on the proxy's web page and the page should appear infront of you, served via the proxy server.





page. Select the 'Standard Response' option and click 'Done'. To add a URL or IP address to the category, click 'Manage Category Details'. Click 'Add URL/IP' and enter the destination in the input box. If you're entering a URL, omit the 'http://www' prefix.

When you've finished, press 'Done'. Confirm that you want to save your changes and enter a filename for the ban list. So that FreeProxy understands the type of traffic to ban (in this case HTTP), double-click the default Proxy entry on the main pane of the user interface. Select your LAN card in the drop-down Local Binding list and then press 'Permissions'. A subwindow will appear. Click 'Add Resource', change the type to 'Ban List URL of IP address' and press 'Done' on each subwindow to dismiss it.

On the main interface, click 'Options', then click the 'Activate the Ban List?' tickbox and select the ban list using the file browser below it. Restart the proxy server and try surfing to a banned site. The browser should load nothing, but allow you to surf elsewhere.

CREATING ERROR PAGES

To link an error page you've made to a category in your ban list, open the list again, click the relevant category and change the redirect response to 'Error Page'. Click the folder icon and select the error page. Click 'Open' to select it and 'Done' to finish. Click 'Done' in the Ban List window and agree to save the list if required. Click 'Done' and restart the proxy. Now try to access the banned web page.

Your custom error page should appear. To log the domains and IP addresses that any person or program tries to access from your network, click 'Options'. Click 'Log access data' and the relevant options will become active. Enter a path and filename for the log file and leave the report content on 'Forbidden'. This means you'll only record attempts to access banned content. Select 'Show full URL' to record the full path to the banned page. Click 'Done', try surfing to a banned URL and inspect the content of the log file. GO TO ➔

OTHER USES

Some proxy servers have very esoteric functions, such as examining the traffic that passes through them for the signatures of attacks by hackers or malware. These so-called intrusion detection systems actually form a class of defensive software in their own right. Other proxies scan images and can determine if there's enough flesh tone in a photo to flag it as suspected porn.

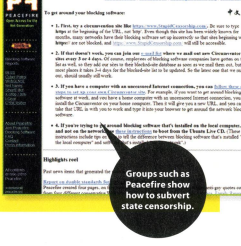
SPOTLIGHT ON... TYPES OF PROXY

Proxy servers are used for all kinds of things. Perhaps their most common use is to cache previously accessed files, such as web page decorations that hardly ever change. Serving these from the proxy server rather than fetching them from over the internet is a more efficient use of bandwidth. The types of traffic with which they're most closely associated is what defines proxy server types.

Web proxies are used to both refine the idea of caching content and block specific web domains and pages. This might be by file type, web page or entire site. Blacklist services provide regular updates to blacklists and whitelists for proxies to use when filtering web content.

The blacklist approach has the proxy server allow everything through save for whatever is on the blacklist. A whitelist defines the types of content that can pass through the proxy.

Some countries block vast amounts of the internet in an attempt to keep news and other information from their citizens. Proxy servers set up in other countries can allow people to bypass this censorship by making traffic appear to be going to and from an innocent server. In fact, this server passes on requests to the banned resource. Some anti-censorship groups such as Peacefire (**www.peacefire.org**) give detailed instructions on how to bypass this type of state censorship using proxies.



MATHEMATICS

Generate beautiful 3D fractal images

Mike Bedford transcends the second dimension and enters the third to see fractals in a completely different light.

WHAT YOU'LL NEED

FRACTAL EXPLORER

This free fractal software is available from *bit.ly/aNdYWx*. Just unzip it into its own folder and then double-click on 'fe.exe' from within Windows Explorer to run it. We'll also be using the Fractal Landscape Library (from the same URL), which adds 3D functionality. Simply unzip this into the same folder as Fractal Explorer to use it.

VISIONS OF CHAOS

For the 3D Mandelbulb we're going to be using Visions of Chaos. You'll find a trial version at *bit.ly/bZqgI4*. The trial version isn't time-limited, though the print and save functions are disabled. The full version costs $45.

Fractals – geometric shapes that look similar however much you magnify them – have kept mathematically minded people entertained for decades. The Mandelbrot Set, perhaps the most famous fractal of all, has been described as one of the most astonishing objects in the whole of mathematics. But despite its amazing complexity, it's firmly rooted in two dimensions. For those of us who can imagine the incredible potential of the Mandelbrot Set in 3D, there's happy news. For years we've known of the concept of 3D fractals, and recently, a three-dimensional figure with many of the same qualities as the Mandelbrot Set was discovered.

THE SIERPINSKI TETRAHEDRON

The Mandelbrot Set is an example of an Escape Time Fractal, but the first fractals to be discovered were somewhat different. Whereas the Mandelbrot Set is the result – unexpected to many – of applying a very simple mathematical operation, the earliest fractals were designed to have fractal properties. The Sierpinski Triangle (sometimes called the Sierpinski Gasket) is a good example. Take a solid (filled-in) equilateral triangle, divide it into four smaller equilateral triangles and then remove the middle one of those triangles so that you end up with a large equilateral triangle with a smaller triangular hole in it. Now, for each of the remaining three smaller triangles, repeat the operation. Keep on doing this, with ever-smaller triangles, forever. The end result is a fractal figure – however much you magnify it, you'll see the same detail at ever-smaller scales.

Along with the cube, the octahedron, the dodecahedron and the icosahedron, the tetrahedron is an example of the class of regular polyhedra known as the Platonic Solids. Each one of the tetrahedron's four faces is an equilateral triangle, so, in this sense, it can be thought of as a three-dimensional extension to the equilateral triangle. As such, it suggests a method of extending the Sierpinski Triangle into the third dimension. The process is much the same as we saw for the Sierpinski Triangle except that instead of splitting the triangle into four half-size triangles and removing the middle one, for each generation the Tetrahedron is split into five half-size tetrahedra and the middle one removed. This is not nearly as easy to do on-screen, but we have reproduced an image of one on page 97.

3D MODELS

It's early days yet, so prices are high, but 3D printing – that's the creation of solid objects from a computer model – could put 3D fractals on the mantelpiece. For example, here is a 3D model of a Menger sponge (similar to the Sierpinski tetrahedron but based on a cube) that you can buy: bit.ly/menspon.

MANDELBROT MOUNTAIN

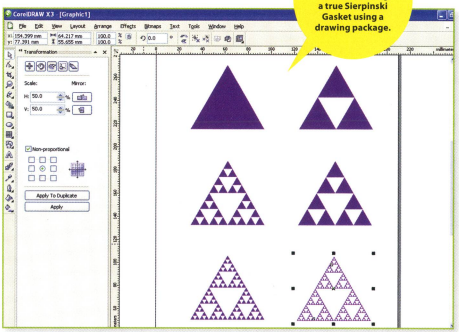
The Mandelbrot Set is special in a way that the likes of fractals such as the Sierpinski Triangle aren't. For a start it's produced from a mathematical function, and a very simple one at that. And second, unlike the Sierpinski



The extraordinary detail of the Mandelbulb, a 3D equivalent of the Mandelbrot Set, as rendered with Visions of Chaos.

SEE THE MANDELBULB IN TRUE 3D

So you've seen an image of the three-dimensional Mandelbulb, but, fascinating as it might be to zoom in on its amazing complexity, it still looks flat on-screen. Thanks to Vision of Chaos' anaglyph feature, you can see it in stereoscopic 3D. On the Mandelbulb options dialog box, select the 'anaglyph' tickbox near the bottom left corner. Then, depending on which type of 3D glasses you're using, select either 'anaglyph red Blue' or 'anaglyph red Cyan' from the dropdown menu. You could also try 'anaglyph Colour' or 'anaglyph half Colour', both of which will work with red/cyan glasses, but depending on the colour palette you've chosen, the 3D effect might not be as good. You can also increase the value of the 'Degrees between eyes' tickbox.



The longer you go on, the closer you come to creating a true Sierpinski Gasket using a drawing package.

Triangle and its ilk (which are exactly the same at all levels of magnification), the Mandelbrot Set shows self-similarity at all levels of magnification. Rarely do you see exactly the same things as you zoom in, though you do usually see similar pinwheels, starbursts, irregular shapes that look like lakes and so forth. The fact that you don't know exactly what you'll see as you zoom in is a major part of the Mandelbrot Set's appeal. So can such a complex fractal really be created in 3D?

Before we answer that question, let's just say that it's quite possible to use three dimensions to display the standard two-dimensional Mandelbrot Set. Here we're going to use Fractal Explorer together with the Fractal Landscape Library. Start up this package and select 'New Fractal' from the File menu. The familiar Mandelbrot (the default fractal) will appear. If you want to see it better select a larger size in the Size menu (though when we come to turn it into a fractal landscape, the size it can handle is limited). If you haven't delved into the Mandelbrot Set before, we suggest you do before proceeding.

To zoom in on any portion, drag a box around it and double-click inside that box. Note that you'll only get an interesting result if you zoom in where there appears to be lots of action.

Now that you've satisfied your curiosity, get the complete (not zoomed-in) Mandelbrot Set on-screen. The black irregular shape in the centre is the actual Mandelbrot Set, and the coloured area that surrounds it shows contours that indicate how close points are to being within it. This might be hard to appreciate with the default colour scheme (the colours blend into each other) but if you choose a different group of colours then the contours will become more visible. To do this select 'Colour control' from the Fractal menu and on the Palette dialog box, ensure the Palette tab is selected. Next, bring up the Palette browser by clicking on the appropriate black triangle. Choose the Examples folder and then select 'Polinom3.frs' by double-clicking on it. Contours are generally associated with altitude, so this suggests one possible means of rendering the normally two-dimensional Mandelbrot Set in three dimensions.

To see the Mandelbrot Set as a 3D figure, in which the information in the contours is translated to height above sea level, click on the 3D icon on the tool bar. Having looked at the entire Mandelbrot Set in 3D – which resembles a strangely symmetrical mountain range with a flat plateau – try doing the same with zoomed-in portions. There are options in Fractal Landscapes to change your viewing angle and how the landscape is rendered.

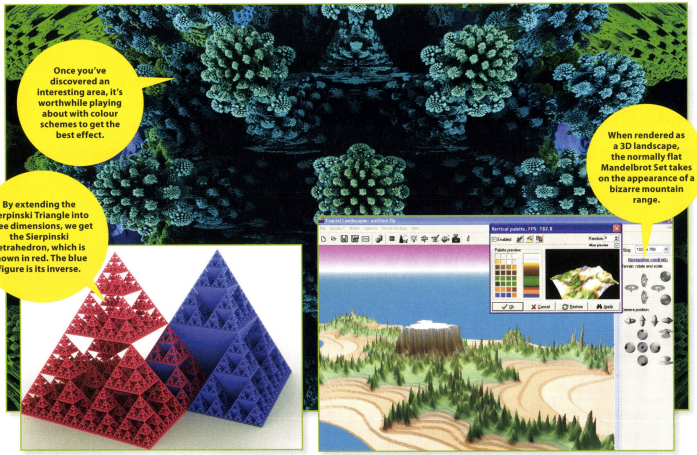
ESCAPE TIME FRACTALS

The 2D Sierpinski triangle and the 3D Sierpinski tetrahedron can be thought of as 'synthetic fractals' in the sense that the rules that are used to create them were designed to produce a fractal result. The 2D Mandelbrot set and the 3D Mandelbulb are quite different. They are both examples of a class of mathematical shapes known as Escape time Fractals, and to the non-expert it comes as quite a surprise that the algorithms used can give rise to literally infinite detail.

To cut a long story short, an Escape time Fractal is generated by testing points (on the complex plane, in the case of 2D fractals) to see whether or not they're a part of the fractal figure. Testing a point involves carrying out an operation (in the case of the Mandelbrot set, squaring it and adding a constant) repeatedly. In some cases the value soon becomes very large and heads off to infinity. This point is said to have escaped, and represents a point that isn't in the fractal figure. Other points give a small result, however many times the operation is repeated, and these are the points contained within the fractal figure.

Time Fractals are capable of producing spectacular results.





THE MANDELBULB

If you consider our foray into the Mandelbrot Mountain to be cheating and yearn for a genuine 3D Mandelbrot Set, fear not. After years of searching, experimenters have found something that is a very close 3D analogue. Called the Mandelbulb, it shares much of its two-dimensional counterpart's appeal and exhibits fractal detail in all three dimensions.

Trying it out for yourself is far better than reading someone else's description, so start up Visions of Chaos. Select 'Hypercomplex Fractals > Mandelbulb' from the Mode menu and then select 'Generate' from the Image menu. The Mandelbulb Options dialog box will appear, complete with a range of parameters and tickboxes to choose from.

For now we'll accept the default values, so click 'Render' to get your first glimpse of the Mandelbulb. This default figure offers an amazing degree of variety in its fractal depths, and the Mandelbulb Options window lets you experiment with lots of other similar 3D fractals when you're done with this one. For now, though, we suggest you stick with the default Mandelbulb and try your hand at zooming in. Unlike 2D fractals, which are normally zoomed into by dragging a box around an area of interest, zooming into a 3D figure is much harder to define using a mouse – so the controls are provided by parameters in the Mandelbulb Options window.

There are two ways of navigating a 3D object. If you know an area you want to look at – perhaps because someone has suggested it – then you can enter values for various parameters in the top left of the dialog box. Otherwise, your best option is to progressively zoom in and pan around using the Camera Controls at the top right. Note that in addition to the various buttons such as 'Forward' and 'Backward', you can choose how much to move when moving or tilting the camera by entering values for 'Move distance' and 'Rotation/tilt degrees'. If you use the camera controls, the Preview window updates automatically; if you change a parameter then you'll need to click on 'Preview' to update it. When you're happy with the preview, click 'Render' to see your creation in all its three-dimensional glory.

GO ON A SIGHTSEEING TOUR OF THE MANDELBULB

Having introduced you to Visions of Chaos and the Mandelbulb, we've given you every opportunity to waste untold hours in search of the ultimate fractal image. However, if you'd prefer to save some time then you can travel straight to some already-known beauty spots in this alternative world.

The secret is to use some of the canned scenes that are shipped with Visions of Chaos. In the Mandelbulb options window, simply click on 'load' and then select one of the Mandelbulb parameter files. If you are interested in the original Mandelbulb as opposed to its many close relatives, make sure you load one of the files with a name that starts 'mandelbulb sin power 8', or 'anaglyph mandelbulb sin power 8' if you want to view it in stereoscopic 3D. Alternatively, you could use one of the canned scenes as a starting point to zoom in yet further on this otherworldly object.

Whichever way you choose, though, bear in mind that rendering the Mandelbulb involves some serious number crunching. Jason Rampe, creator of Visions of Chaos, estimated that because of the need to first calculate in 3D and then raytrace the Mandelbulb, it requires many hundreds of times more calculations per pixel than the Mandelbrot set does. Obviously some patience (and a faster PC) is called for.

IN THIS SERIES

Did you build a web site and nobody came? Ash Nallawalla walks you through everything you need to know in order to optimise your web site for search engines so as to generate traffic and get hits on your site.

APC EXPERT



ASH NALLAWALLA

Ash Nallawalla is a search marketing consultant who has managed natural and paid search traffic for some of Australia's largest websites. He is an internationally acknowledged expert in search marketing and he runs an online SEO training website. Ash can be contacted at **ash@melbpc.org.au** or via his blog at **www.netmagellan.com.**

WHAT'S NEXT?

PART 12
AUGUST 2010
ADVANCED SEARCH TECHNIQUES

PART II ONLINE REPUTATION

Reputation management

"It takes 20 years to build a reputation and five minutes to ruin it. Think about that, you'll do things differently." — Warren Buffett.

Protecting your online reputation is crucial, be it your personal reputation or that of your business. What does a negative reputation look like? The list is limitless, but usually it is:

- Forum discussions by unhappy customers, often with no personal identification
- News reports about something you'd rather forget and which you don't want someone to find in the future
- Negative reviews and ratings
- Poison pen email campaigns
- Negative tweets on Twitter and similar microblogs
- Web sites built just to criticise someone or a business
- Negative discussions on social media platforms such as Facebook or forums
- Product comparisons on other sites

You don't need to have done something bad to get a negative online profile. Simply being noted as active at some social network site may be enough for a potential employer to reject you.

Hell hath no fury like an eager Aussie iPad customer whose NAB credit card wouldn't work when he finally reached the counter in San Francisco (at 10am on the US iPad launch day). The launch happened to coincide with a planned outage at several Australian banks on account of daylight time changeover at 3am AEST. The customer was our own Dan Warne, who was furious at the explanation when he finally spoke to the NAB lost card operator. He blogged about it at his blog **danwarne.com** and later posted an update after getting an apology from the bank.

Most busy airlines manage to delay, misroute, lose or damage a few items of luggage every day. Depending on who you are and who you encounter at the lost baggage counter, you may not get adequate satisfaction for your loss or inconvenience. When United Airlines broke my four-wheeler suitcase like an eggshell, they replaced it with a two-wheeler.

When United baggage handlers broke Canadian musician Dave Carroll's expensive Taylor guitar, he got even. The story is best viewed in three musical videos he placed on YouTube. See **bit.ly/z2GU5**. At 8 million views and counting, who knows how many people have avoided flying United as a direct result. According to one report, United shares dropped in price by 10% within days.

When a complaint goes viral.





PRE-EMPTION IS BETTER

Like diamonds, the internet is forever. Once something goes online, there is a good chance that it will be stored not only by large archives such as text/image/video search engines but also by individuals who will save a personal copy just in case the online version disappears. Many people know how to use search engines to research a company or individual, so they are bound to find negative sentiments if they rank in the top 10 or 20 results.

In a perfect world, you will leave no online trace, or, at best, only positive or neutral content. This world isn't perfect, so we will look at some pre-emptive strategies first.

If you represent a well-known company that sells consumer products, buy all kinds of domain names with negative words such as:

- <Brand>sucks.com, .net, .org etc.
- Ihate<Brand>.com, .net, .org etc.

You get the idea. You might not think of every possible name (or be beaten to the punch), such as telstrasucks.com, although the latter doesn't seem to have much negative content these days. There is a Facebook group with a similar name that is very negative in sentiment.

BE POSITIVE

Create a lot of positive content by way of profiles at sites such as:

- **www.aboutus.org**
- **www.linkedin.com**
- **www.facebook.com**
- **http://twitter.com**

We'll explain this as we go along.

Performing search engine optimisation (SEO) on your own web site is a great idea at the best of times. Depending on your business prominence, you will also get unsolicited links from other sites, which all help to improve your rankings.

Getting positive coverage that ranks high in the search results should be your goal. I had a client in a high-profile profession who had a fairly common name. When you searched for his name, the first result was a newspaper article about a serious charge that was dismissed by the court. He wanted this result to go away. The second result was about a namesake, next came his business web site, then a few other results about other namesakes.

The solution was to set up a new web site using a domain name bearing his full name. It was a small site that listed his resume, his experience, his specialties, and so on. Following a sustained link building campaign for this new site and for the namesakes, the negative newspaper article disappeared off the first page.

You can only hope for top ranking for a company or individual name. If someone were to search for a negative incident, eg. "Joe Bloggs court appearance", they will get nothing but the negative results all over the first page.

If your business has some depth and history, try submitting an entry to Wikipedia. As long as it doesn't read like a marketing brochure, it will be allowed to remain and rank well for the name.

TESTIMONIALS

When you get positive feedback from someone at another web site, link to that page from yours. Submit their URL, if appropriate, to sites such as StumbleUpon, Digg and Delicious. Ask your happy customers to post their comments at consumer opinion sites such as Menulog (if you run a restaurant). Make testimonials easy by leaving them a form and pencil per diner and upload the best to your own web site. Offer an incentive for completing those forms.

REVIEWS

Some review sites allow the business owner to respond to negative reviews, because some of them could be written by competitors or are otherwise damaging if left out there unchallenged. One US rating site uses a "Reputation Trend" graph which shows whether the reputation is increasing or declining.

LIBEL

From time to time, private citizens engage in online flame wars that may constitute libel. Over 10 years ago I was one of the volunteer administrators at an ISP where a subscriber managed to enrage a serial litigant in a Usenet newsgroup. The latter asked us for the poster's contact details and innocently we told him that we couldn't comply for privacy reasons.

We were served with a suit in an overseas jurisdiction and in brief we had to settle for a five-figure sum including our legal fees.

What can you do if you are libelled at some forum without any prior altercation? If it is within Australia, your lawyer can resolve it, but if overseas, your job becomes more difficult. Search engines generally will not comply with a simple



lawyer's request but may require a court ruling. At the offending forum you could try asking the forum operator through a polite, private message.

NEWSPAPERS

Newspapers have online archives that are indexed by search engines. Owing to their high degree of trust in the eyes of search engines and the large number of quality backlinks, their content usually ranks high. If the articles are positive, this is good – you need more of this coverage.

A news article might mention a court appearance or an arrest by the police. However, at a later date, the court dismisses all charges. This is all duly reported in the newspapers. Unfortunately, this content is factual and will probably not be expunged. The internet can be unforgiving in this regard.

Once in a while, the newspaper makes a mistake. Say, your namesake is a criminal and has been sent to prison, but the newspaper publishes your photograph on the front page. You get on the phone and demand a correction, which appears as a small paragraph deep inside the paper. You don't need a printed retraction as much as you do a removal of the online copy of your photograph.

Sometimes you make a mistake and are reported accurately. Think of BP and the oil leak in the Gulf of Mexico. The only solution is to fix the oil leak before expecting the online debris to sink to the bottom of search results.

SOCIAL MEDIA

Before we talk about social networks and bookmarking sites, make sure that you have secured user names for your brand at the major sites. Luckily for you, sites such as knowem.com and namechk.com will let you check hundreds of sites for availability with a single click. For a fee, they will even grab the desired user name if it is still available.

Recently, I had to advise a client that her proposed brand name was not a good idea because it wasn't available at Twitter and Facebook, whose users are relevant to her business. The .com domain name had also gone, so it was a non-starter. If you are starting a new company, do this homework before getting enamoured by a brand name.

FACEBOOK

Privately owned, Facebook is contagious. Even if you resist signing up now, some day you will succumb. What many people don't know is that when you take part in some quiz or try something your friend sends you, you are giving access to all your information to an unknown entity and not all of them have noble intentions. While this is being written, Facebook is improving its privacy features, but if you can't help using the service, remove access to your information and unsubscribe from all applications.

MANAGEMENT

Managing your online reputation involves monitoring thousands of web sites, so you need to find some tools to help you along.

You could use search engine tools, such as Google Alerts – **www.google.com/alerts**. You will receive emails with links to any mention of your keyword. You can construct the search query just as you would use the search engine, that is, with phrases in quotes, negatives and Boolean operators.

SocialMention.com is a free service that gives a wealth of information when you supply a keyword. It tries to measure sentiment, but this relies on categorising words as positive, neutral and negative, so don't expect it to be very accurate.

Trackur.com offers a free basic monitoring service and more comprehensive, paid options. You can ask for optional filters such as required words, negative words and excluded domains. When I tried to look up the NAB for signs of Dan's travails, I had to add a lot of negative words to filter out instances of the verb "to nab", which dominate the results. You can manually assign the sentiment and this will be stored for you for subsequent retrieval.

BlogPulse.com by Nielsen helps you to monitor conversations on blogs. It also lists the hottest topics and search terms, many other trending sites and content.

BoardTracker.com monitors discussion forums. It displays the information attractively and is free to use at the moment. Brand managers and PR agencies find its Alerts service valuable.

WhosTalkin.com monitors several types of social media such as blogs, forums, news, images and so on. I found it good at filtering out the non-Australian "Sensis" companies (there are a few) when I worked at that company. SocialMention couldn't cope well with that word even though you can set a language filter.

Many large companies such as Westpac use their Twitter.com account to communicate with customers. This works for some business models but not for others. They monitor all mentions of their brands, looking for positive and negative remarks. They have to work hard to be helpful, polite and restrained when under consumer attack. When a positive tone is perceived by readers, the bulk of the comments tend to be civil.

Next month we will look at clever ways to find needles in a virtual haystack – that is, advanced search techniques.

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DAVID BRAUE

David Braue is a multiple award-winning journalist who has been writing on Australia's IT industry since the release of Windows 95. Fifteen years and millions of words later, he has poked, prodded, ruminated, and reported on all kinds of enterprise and consumer technologies, as well as the people that implement and use them.

APPLICATIONS

Living on cloud 99.999%

Cloud computing is big business. In fact, it's even bigger than business. **David Braue** takes a look at the cloud on the horizon.

Email is the lifeblood of many companies, but figuring out how to safely archive all of your mail isn't always easy. But with senior executives pressuring him to deliver 100% email uptime (a target that is far more expensive and difficult to hit than most people appreciate) James Katarski found an answer in Dell EMS Email Continuity, a cloud-computing solution in which all of his company's emails are backed up from its Microsoft Exchange server to a Dell data centre.

It may seem like a small step, but for Wesfarmers – a massive agricultural business with over 300 employees and business endeavours across the country – wrapping up new mail in batches, encrypting the messages and shooting them into the cloud was revolutionary.

"The absolute primary business tool used in the office is email," explains Katarski, who as senior systems admin was front and centre in the project. "We can keep a month's worth of email available for every mailbox, at all times; if at worst case we lose our Microsoft Exchange environment, we still have backup. It's given us peace of mind and saved quite a considerable amount of money."

INTO THE CLOUDS AT LAST

It may seem straightforward, but this type of application is rapidly turning Australian businesses onto the promise of cloud computing – that long-emerging model in which other companies run your applications and host your data for you, and you just rent access to them. Built to last and offering the kind of 99.999% uptime that most companies simply cannot afford, cloud computing services are finally coming into their own, revolutionising companies' IT infrastructures.

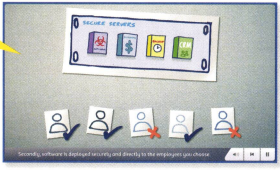
Recent figures from an Avanade-sponsored study by Kelton Research recorded strong interest in the model: 64% reported that they had already started using software-as-a-service (SaaS) applications – the most common form of cloud computing – with 52% using SaaS for a year or less, 97% reporting their experience as largely "successful", and 67% looking to increase their SaaS usage over the next year.

Cloud computing's recent popularity comes from a perfect storm of enablers. Telecommunications services are cheap and fast enough that you can quickly access hosted services. Critical technologies that used to be unthinkably complex for small businesses – service-oriented architecture (SOA), enterprise application integration (EAI), XML-based data exchange, server virtualisation, and more – have been pushed behind the scenes so you can focus on the applications you need. And massive industry investment in data centre space is bringing down the cost of systems to host cloud solutions, allowing innovative companies to offer cloud services at quite-reasonable prices.

IT strategy used to be all about owning equipment and applications, but in today's cloud world this is no longer necessary. By picking and choosing appropriate services, you can easily access best-of-breed options and industry expertise without six or seven-figure price tags. Since applications don't have to be installed from the ground up in each company, costs can be amortised far more effectively as cloud-computing providers like Microsoft, IBM, Google, HP, VMware and Amazon simply build one very large instance of an application, then keep adding enough servers to keep up with demand.

"You can add scale very quickly these days, whether with storage or server capacity," Telstra acting CIO

Software-as-a-service (SaaS) offerings like Telstra T-Suite let you pick and choose the applications you need (and the employees that can access them online).



MICROSOFT PAINTS THE TOWN AZURE

When Microsoft makes a major platform commitment, the world listens – and Microsoft's Azure cloud-computing fabric has garnered loads of attention this year.

A global platform for hosting and running applications, Azure is Microsoft's version of Amazon's EC2 – a PaaS designed to give developers a single place to run applications. Once applications are written for Azure, they can be accessed by anybody, anywhere and linked together with other services in the cloud to produce new combinations. Microsoft keeps the applications running and stores data on the applications' behalf.

Azure already has several elements, including the Azure platform, Microsoft SQL Azure hosted database, Windows Azure platform AppFabric for linking applications within the cloud, and 'Dallas' – a project that will publish massive data sets from the likes of NASA for access by any application using the cloud.

Microsoft is helping businesses and developers transition to Azure so they can roll out applications in the cloud as easily as they currently do in their own networks – but without the escalating infrastructure costs. US-based early adopter Kelley Blue Book, which publishes guides for valuing cars, estimates Azure will save it US$100,000 annually in hosting and capital costs.

Azure is about more than just avoiding expenses, however: easy data interoperability offers promise, as Microsoft demonstrated at its recent REMIX10 conference in Melbourne. In a live demo, developer evangelist Michael Kordahi put his mobile phone onto a Microsoft Surface table computer, which recognised his Foxtel account and connected to Foxtel's systems through the Azure cloud. Foxtel sent a list of movies he might like and he tapped one to start watching it.

A few minutes into the demo, he dragged the movie onto his phone's Surface icon, transferring the still-playing movie. The movie kept playing even as he walked away, and was just as easily accessible on a tablet PC – showing how storing content and control applications in Azure makes them available on and across any device.



Storing data and applications in Microsoft's Azure environment enabled a movie to follow the user from a Surface computer to a smartphone and a tablet computer.

Ashley Lazaro said in a recent interview. "The advantage we have over most companies is we can bring both the IT infrastructure and the networks together as a seamless infrastructure service to a particular customer, so a customer doesn't have to invest in data centres and boxes and servers and storage and worry about power and failures."

Cloud computing's confluence of telecommunications and application hosting has made it a prime strategic direction for Telstra, which is reworking its data centre environment to support expected demand for cloud offerings like its T-Suite (**bit.ly/aVLrBa**) – an amalgam of cloud applications including Microsoft Online Services (which bundles Exchange, SharePoint, Office Live Meeting and Office Communications applications into Microsoft's own Business Productivity Online Suite, or BPOS) and Telstra backup, McAfee antivirus, firewall, MessageLabs web and email scanning, Xero accounting, Workforce Guardian HR compliance, Microsoft Dynamics and WORKetc customer relationship management, and other capabilities. Tick the boxes for the applications you want and you can be up and running within minutes.

For businesses with limited cashflow and capital-constrained visions for growth, that can make a major difference. Screw wholesaler General Fasteners, for example, is saving hundreds of dollars a month after signing on for T-Suite's workforce management and data backup capabilities.

"If we had to buy the same sort of software once-off, we'd probably have to get a loan," says MD Anthony Rosier. "I've seen a few other small businesses doing it on the cheap, but if you're trying to grow and do it properly, it gets very expensive. It can cost $2,000 a month for people just to come out and check your server."

EVERYTHING AS A SERVICE

The idea of delivering applications over the internet has had many names: application service provider (ASP), service-oriented architecture (SOA), managed services, web services and SaaS, among others. These concepts stretch back over a decade, but its newfound viability has seen the industry flooded with offerings classed as infrastructure as a service (IaaS), platform as a service (PaaS), communications as a service, security as a service, computing as a service, storage as a service, and others.

Each type of solution deals with different parts of your business. For example, Amazon Web Services' (AWS) PaaS offering, the Elastic Compute Cloud (EC2, **http://aws.amazon.com/ec2/**), uses server virtualisation to provide a generic framework that you can use to quickly set up additional servers; if you're launching a new product and expect a flood of customer web site visits, you could use it to buy excess short-term capacity or a platform for testing new releases of your e-commerce back end.

You can load basically anything onto EC2 by creating your own Amazon Machine Image (AMI); AWS hosts and runs the environment, doing all the back-end housekeeping to make sure everything keeps running smoothly. AWS also offers Windows Server, Linux or OpenSolaris virtual server templates preconfigured for a variety of uses, such as high-CPU or high-memory, while third-party AMIs provide instant access to high-end business applications like IBM DB2, Oracle 11g, IBM WebSphere Application Server and more.

You'll save a bundle if you set up your infrastructure carefully. An AWS High-Memory Quadruple Extra Large Instance (HMQELI) out of the company's Singapore data centre, for example, provides 68.4GB of memory, 1.69TB of local storage and 26 EC2 compute units; each compute unit provides similar computing power to a 2007-era Intel Xeon CPU. You'd pay tens of thousands of dollars to buy and run a server like that, but you can get a Windows Server setup on that configuration for just US$2.88 per hour – about US$485 for a week's worth of top-tier computing power.

AWS has built an entire marketplace around its compute services: on-demand pricing is the highest, but you can also reserve a permanently available server for a lower price over a period of one to three years, or bid on 'spot instances' that run your virtual server whenever there's spare capacity available. When we checked, a



reserved Windows Server HMQELI instance was going for US$1.38 per hour, with the same instance costing US$1.44 per hour on the spot market.

Amazon's other key cloud offering is S3 (Simple Storage Service), a storage-as-a-service offering for which customers pay a flat rate per month, per gigabyte via third-party applications like the JungleDisk incremental backup service. Amazon's other cloud offerings duplicate yet other parts of the typical business computing environment.

RUSH TO THE CLOUD

Amazon may have been the first major cloud provider, but industry heavyweights and niche players around the world are rushing to build their own offerings. Indeed, few business products are announced these days that don't have a cloud-computing angle.

NetSuite, for example, recently launched its fully hosted NetSuite Manufacturing Edition for manufacturing customers. Novell debuted its Cloud Security Service, providing identity and access management for hosted applications. NEC Australia's Data Centre Services is an IaaS play that runs from the company's $241m new Polaris data centre, providing full data centre capabilities for companies that want to set up a disaster recovery site without going to all the expense. Hosting provider WebCentral recently began offering MiCloud, a set of Microsoft-backed tools to help developers SaaS-ify their offerings. And Boomi AtomSphere provides integration services to help link cloud and on-premises applications.

VMware and Google are working together on a PaaS offering that looks set to challenge Amazon EC2. Fonality is offering Fonality Connect, a complete hosted PABX for small businesses that can be set up in minutes and costs $39 or $55 per month, per user. Citrix Cloud Center (C3) is a suite of SaaS-enabling tools for software vendors. Optus is ramping up its cloud service and recently announced WA's Curtin University of Technology as its first major customer. And Nivio, running from NEC's Polaris data centre, is hosting complete Windows desktops and online storage for a flat rate per month, per user.

Some services require long-term commitment, while others are easy-in, easy-out solutions that belie the complexity and commitment that similar solutions used to require. Following on from its early success, Wesfarmers, for example, is planning to use Dell's Software Inventory & Usage Management SaaS for a one-off inventory of its computer equipment and applications.

"We could go and invest in an extensive network management system for two, three, five years," Katarski says, "but all we need is a snapshot of what we have. This solution costs us next to nothing, and we don't have to worry about setting up more servers. It's this kind of speed and agility that SaaS gives us: we're not locked in, and can change our minds or do what is most cost-effective."

CASTLES IN THE AIR

If it sounds like you can get just about anything from the cloud these days, you're right – and the selection is only going to continue growing as application vendors cloud-ify their applications and startups use the model to quickly bring new solutions to market.

Cloud computing promises significant benefits, as the recent CA-sponsored Security of Cloud Computing study (**bit.ly/9ejn3t**) found: 73% of respondents said they'd moved to cloud computing to reduce costs, 57% to speed deployment time, 56% to increase efficiency, and 38% to improve flexibility and choice.

Security, however, remains a big concern; many executives are still quite antsy about handing over the keys to their information systems to arm's-length providers, especially when it's not always clear where they're located and they may not have physical access to the infrastructure or control over who can access information.

There may also be legal restrictions on sending customer data outside of Australia, and governance implications when a computing environment extends across international waters. If you're considering an extensive cloud investment, make sure your legal advisor is involved to minimise risk.

SaaS may be about running applications over the internet, but cloud computing is a much broader vision that will create a massive, interlinked array of fully-functional computing environments. Mix-and-match IT becomes inherently possible in this environment, but vendors are now wrestling with ways to let you seamlessly move data to and from cloud applications as necessary.

The Open Cloud Initiative (**www.opencloudinitiative.org/**), for example, is promoting interoperability between different cloud environments. The Open Cloud Consortium – with members including Yahoo!, Raytheon, Cisco and several US university research groups, is doing the same over hosted testbeds. Ditto the Cloud Computing Interoperability Forum (**www.cloudforum.org/**), which unites the likes of Cisco, Intel, Sun, IBM, RSA and others.

With so much industry rationalisation going on, it will be some time before the massive and still-nebulous cloud computing market solidifies around common standards. Measuring out the scope of the task, cloud-computing watcher Jeremy Geelan recently identified the top 250 players in the cloud computing ecosystem (**bit.ly/9vbltF**). Many will go bust, others will be bought by larger players, and still others may thrive to become pace-setters in this fast-moving industry – but all are sure to play some part in shaping its destiny.

GET OFF OF MY CLOUD

Given the momentum behind cloud computing, it's clear that the model will eventually offer the potential of managing nearly every part of the business computing environment. The business case is a no-brainer: companies avoid the cost and effort of building application environments internally, and developers can focus on building smart applications instead of wasting time managing and upgrading stock-standard software.

The Commonwealth Bank, for one, recently completed a massive server overhaul that has cut server numbers in half, and is promoting an international thinktank called the Enterprise Cloud Leadership Council that will see like-minded institutions working together to take advantage of cloud computing. "There is no long-term competitive advantage of having created [infrastructure] and retaining that for your own purposes," CIO Michael Harte said in a speech earlier this year. "You are better off sharing those things."

Some businesses are so eager that they're rushing ahead with the construction of 'private clouds' that are contained within the company. Private clouds are much like the systems that have been used for decades, except that their use of web standards makes them easy to reuse across business divisions – something that makes them hugely popular with big companies. For example, a central computing group could quickly commission 20 of a particular type of server and operating system to support a rapid-turnaround marketing project; marketing could focus on the project, and not on building its own IT infrastructure.

Outside standards are trickling their way into the private cloud: Eucalyptus Systems' Eucalyptus Project, for example, allows companies to build private clouds that follow Amazon's EC2 and S3 services, so companies can use AWS-compatible cloud services inside their businesses. Red Hat's Cloud Access Initiative is helping Red Hat Enterprise Linux customers move to EC2.

Such efforts suggest that, because it is the world's most fully-realised cloud-computing implementation, EC2 is becoming the de facto standard, just as VMware's server virtualisation cornered that market; third-party solutions like the Symplified Trust Cloud identity management system are specifically designed with EC2 in mind.

Since you're not likely to move your entire business onto the cloud overnight, many analysts expect years of 'hybrid' private-public cloud computing – and many potential disasters for companies that misstep on the road to cloud computing.

"Instead of a nimbler IT with their IT mess for less somewhere else, the ill-prepared will end up with their IT mess spread across a wider area," warns Ovum senior analyst Laurent Lachal. The question, he added, "is not just about whether cloud computing is ready for enterprise; it is, more importantly, whether or not enterprises are ready for it."

Philosophically, that question is being answered in the affirmative by a growing number of companies. But cloud computing is still very much an evolving industry, and there will be misses as well as hits. But by getting up to speed with the state of the cloud now, you can position your business to be on the leading edge of competitiveness as the cloud becomes nothing more than the new way computing works. BITE

GET YOUR HEAD IN THE CLOUD

Every man and his dog is announcing cloud-computing something, so you're spoilt for choice if you're considering getting into the cloud. Here's a rundown of some of the most recent cloud offerings to reach Australia's shores:

Vendor	Service	Type	Description	URL
Dell	Software Inventory & Usage Management	SaaS	Software license audit	http://bit.ly/dmtlbh
Dell	Email Management Services	SaaS	Email archive, filtering, and continuity services	http://bit.ly/bFUQKD
Fonality	Fonality Connect	IaaS	Hosted telephony systems and services	www.fonality.com.au
FonGenie	FonGenie	SaaS	Call management service	www.fongenie.com
HyperOffice	HyperOffice	SaaS	Email, document management, calendar, project and contact management	www.hyperoffice.com
McAfee	McAfee SaaS	SaaS	Email archive, filtering, security, continuity, vulnerability assessment, web protection	http://bit.ly/99b0jn
Melbourne IT	Corporate Exchange	SaaS	Microsoft Exchange	http://bit.ly/9uWFfj
Microsoft	Office Web Apps	SaaS	Word processing, presentation, collaboration	office.live.com
NEC Australia	Data Centre Services	PaaS	Complete data centre solution for easy disaster recovery and backup capabilities	http://bit.ly/a9Tj26
NEC Australia	Applications Net	SaaS	Loc8 help desk, Contracts-Now management, Agent 99 call centre management, SugarCRM customer relationship management, Microsoft Exchange messaging	www.applicationsnet.com.au
NEC Australia	Voice Net	IaaS	Hosted telephony system and services	http://bit.ly/cGF2mJ
NetSuite	NetSuite Manufacturing	SaaS	Planning, production, material and work-in-progress management for manufacturers	http://bit.ly/9tLwAG
NetSuite	OneWorld	SaaS	Business management	http://bit.ly/9BkrHm
Nivio	Nivio Business Suite	PaaS	Hosted Windows desktop	www.nivio.com.au
Novell	Cloud Security Service	IaaS	Hosted identity and access management services	www.novell.com/cloud
Optus	Optus Business	SaaS	Business applications	Currently in closed beta
Red Rock Consulting	RockSolid	SaaS	SQL Server management toolset	www.redrock.net.au
Saasu	Saasu	SaaS	Invoicing, expenses, inventory, payroll	www.saasu.com
SalesForce.com	SalesForce	SaaS	Customer relationship management	www.salesforce.com
Symantec	MessageLabs Hosted Services	SaaS	Email security, antivirus, archiving, filtering, web anti-spyware, secure IM	www.messagelabs.com.au
Taleo	Taleo	SaaS	Talent management, recruiting, staff development	www.taleo.com
Telstra	T-Suite	SaaS	Microsoft Business Productivity Online Suite, Dynamics CRM, McAfee, MessageLabs, Xero, Workforce Guardian, WORKetc	http://bit.ly/aVLrBa
TransACT	Google Apps	SaaS	Google Apps collaboration products	www.transact.com.au
Verizon Business	Application Assurance	SaaS	Application performance and availability monitoring	http://bit.ly/cDKmf7
Viocorp	Viostream	SaaS	Digital media publishing platform	www.viocorp.com
WORKetc	WORKetc	SaaS	Customer relationship management, project management, billing	www.worketc.com

I.T. MAKEOVER

We fix storage, you tag the music

We kick off the storage makeover, but as we present solutions, FBi throw up new problems, like how to tag the station's music.

PROJECT MANAGER



TONY SARNO

Tony is the editor of *APC*, but is frustrated that his jazz musician namesake hogs all the Google search returns.

After a first exploratory meeting in which a team from *APC* and Seagate inspected the music storage facilities of community radio station FBi (94.5FM), the team returned to the station this month to discuss its plans with station management for upgrading the station's hardware. At this second meeting Seagate's Sam Zavaglia ran through the proposed hardware upgrades for each of the station's key needs: to store the station's digital music library; to capture and store the station's on-air content and online streaming; and to provide backup storage for office files. Listening to the *APC* and Seagate project makeover team were station manager Evan Kaldor, and FBi Radio director Nick Carr.

DIGITAL STORAGE LIBRARY

As we mentioned in the last issue, FBi's digital music library contains about 20,000 CDs accumulated since the station launched in 2003, all adding up to about 15.9 terabytes of data. To rip all this and store on disk doesn't make sense, since it would call for a massive ripping effort and an unnecessary amount of storage hardware, since the great majority of the songs would not be on the station's rotation list.

So Zavaglia suggested an eight Terabyte Seagate BlackArmor NAS to accommodate the current playlist of around 70GBs of music and all new songs after that. Zavaglia pointed out the NAS technology allows a business to swap out those drives and put larger drives in. The suggested BlackArmor NAS comes with two internet ports and four bays accommodating four two terabyte drives, but the expectation is that new larger drives will be released over time, so FBi won't necessarily have to replace the NAS as its storage needs increase. For instance, Seagate has just announced a 3 terabyte drive (the FreeAgent GoFlex Desk drive). Trying to drive home the benefits of the solution, Zavaglia added: "With the NASs, you can have multiple RAIDS across the four drives, supporting RAID 0, RAID 1, RAID 5 and RAID 10. With RAID 5 you get six terabytes available."

It was the references to RAID that worried director Nick Carr. "One of the concerns we have is basically the level of technical administration skill required to administrate things like RAID, that type of stuff," he said. "So I guess for us it's important that it's not too technical, to recover or administrate the drives."

Zavaglia was at pains to stress that IT admin skills were not necessary to run the NAS drives. "You don't have to be a networking genius to set up a NAS. It's designed to be picked up and used straightaway. "

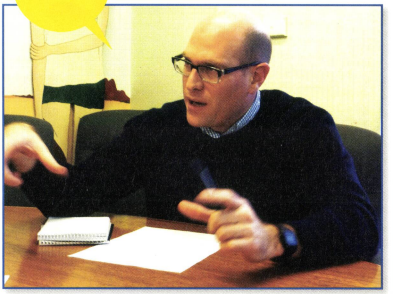
For the on-air content and streaming storage, Zavaglia suggested the installation of another 8TB NAS to sit in the FBi offices. This would enable the station to



FBi Radio Director Nick Carr (foreground) listens to the makeover proposal

WHAT IS FBI 94.5FM?

FBi is an independent community radio station based in the inner Sydney suburb of Alexandria. While "community"may conjure up visions of a small volunteer-driven effort, FBi Radio is anything but. It has studios and a full-power radio transmitter that are equal to those of commercial stations, while its charter allows it to generate commercial revenues. The station's powerful range takes it to 250,000 listeners a week. What we like most about FBi radio is that it has a policy of playing 50% Australian music, making it one of the major supporters of local artists.



FBi Radio's station manager Evan Kaldor

WHAT IS THE FBI MAKEOVER?

Too many published case studies of IT revamps are sanitised to the point where they discuss all the benefits and none of the pain involved. This is a real life makeover of an aspect of a business's IT, in this case, a radio station. We figure that if we can help a radio station store its music, we can also provide you with valuable advice on doing the same at home!



Seagate representatives Pru Quinlan and Sam Zavaglia

capture on air content 24/7 (at 600MB/hour). The aim would be to keep this content as high quality files for one month, then compress and store it for 11 months – then overwrite it.

Kaldor and Carr had no issues with this, so we moved to the next requirement, for office files storage and backup. The station currently has around 931GB of office data, but is rapidly running out of space on its current storage. Zavaglia proposed two 2TB external drives, each backing up the other.

The discussion centred on whether offsite backup would be easier to manage than having someone backing up the drive in the office via the other drive through the USB port. Remote backup was Carr's preferred solution because it was less labour-intensive. It would probably have to be combined with the remote back up suggested for the digital Library.

As a result, the project team will now investigate remote backup solutions, so over the next month we'll talk to likely providers and report back in the next issue.

Overall, FBi was happy with Seagate's proposed hardware solutions. Sensing that FBi's main concern had been administering the IT, Zavaglia drove the point home about the solutions being created specifically for small businesses: "The whole idea of is not to have IT personnel." BTITC

READER CHALLENGE! – TAGGING THE MUSIC

Can you help FBi with its biggest concern? How exactly should they tag their catalogue?

While discussing the best ways to store FBi's music, we discovered that turning the CD library into digital files to be stored on the Seagate NASs will be a massive challenge. The issue is not the hardware, which is straightforward enough, but how the music should be ripped, what format it should be stored in, and, most, importantly, how it should be catalogued and tagged. The last is what keeps Kaldor and Carr awake at night.

"We are particular about making sure that the music we catalogue is correct and accurate, but what happens at the moment is that the information that is contained on CDs is not particularly useful," says Kaldor.

"The way to think about it, when we go home and rip a CD into our computer, iTunes will go to something called Gracenote DDB, which is a central database. Gracenote might come back and say, 'this CD is HOT', but that's not helpful to us, because we need far more specific information than that. For example, it might say it's dance, but we want to know is it Dub, Grime or Party beat? So the issue for us in terms of the ripping is how do we catalogue, specifically and accurately, not just the genres, but all the other information that goes into it, because there's quite a lot of fields that have to be populated."

As Carr points out there isn't a universal system of identifiers for bands or songs. "The closest is this public initiative called MusicBrainz, a kind of global open source system of identifiers for albums and tracks which basically provides a URL for every album artist and every song. But MusicBrainz is largely funded by Google, and the rumour mill says it's the basis of Google's music initiative, which will be announced soon. Another project that seeks to classify music is by a group at BBC radio, but most of it is oriented towards classical music.

Carr says the tagging and cataloguing is particularly important for FBi because "the whole reason FBi exists is to support the local community, a lot of these bands, the records they bring in, the records that get played, aren't released anywhere, they are not commercial records, so they're even further outside the system than obscure records that may be released in say, Scandinavia, so the metadata is really the issue."

We'd like to hear from our *APC* readers who may have ideas on how to best approach this task of tagging and cataloguing the music. Go to **apcmag.com/fbimakeover** to suggest your ideas.

FOLLOW THE FBI MAKEOVER

Follow this series on at apcmag.com/fbimakeover. Coverage includes interview notes, videos and photos.

Indepth
more about...

DEAD EYE
We've seen it in westerns: the protagonist is standing in the middle of a long and dusty road facing off against four or five squinty-eyed miscreants. Then, in a single sweeping move, he puts a bullet in each of them before they can move. Lengthy death scenes ensue. RDR's answer is the Dead Eye meter — which is basically Bullet Time from the Matrix. Game time goes into a period of slow-motion where players mark a number of targets and, once the trigger is pulled, time snaps back to normal and John Marsden unloads a revolver full of lead into whatever was standing in his way.

RANDOM DISTRACTIONS
Someone is always in need of help or intends to rob, kill or cavort with Marsden in early America. Players can expect to come across folk in the process of being robbed / beaten / murdered / escaping / chased / hunting or any combination therein. My favourite is the classic damsel in distress: a lady near a carriage calls out for help and, when John gets close, four heavily armed men spring out and open fire intent on a robbery. And if it's not the people waylaying John, it's the games — Poker, Blackjack, Horseshoes, Arm-wrestling, Cattle-herding, Horse-breaking, Liar's Dive and Five-Finger-Fillet (that game where you quickly stab a knife between your fingers) — are all welcome distractions available for fun and profit.

CAMPFIRES AND CHAPS
Rescue damsels, run bad guys out of town, play some poker and steal a horse... it's all in a days work in RDR.

Red Dead Redemption

Troy Coleman has you at gunpoint; wants you to rub snake oil on his saddle sores.

Take Grand Theft Auto 4, strip out the cities, fast cars, naked women and heavily accented Europeans and in its place slap in an expansive desert, wild animals, damsels in distress and slack-jawed gunslingers – all blended around a beautifully written story – and you'll have Rockstar Games' latest epic, Red Dead Redemption (RDR). Set in America and Mexico in the early 1900s, RDR tells the story of John Marsden (our protagonist), an outlaw turned good, whose wife and son have been taken by a government agency. In order to save his family and get back to an 'honest' living working the land, John must track down and bring to justice the same criminals he once ran with.

In addition to a very lengthy main storyline, there are a series of challenges, bounty quests, side-missions and random encounters (see sidebar) available. Things like hunting animals, sharpshooting, survival and treasure hunts provide more than enough action for around 20-or-so hours of gameplay.

Online multiplayer is also available and is a great deal of fun. Most of the action takes place in Free-roam, which is, as the name suggest, a free-for-all gun-sling-fest for players and NPCs alike. There are a number of personal challenges to complete, as well as several gang hideouts that can be done solo or grouped up in a 'posse' with other players.

As good as it is, there are technical issues that stuck in my craw. GTA IV legacy bugs – character/object pop-ins, bad landscape loads and some *terrible* pathing – have made it into the final release and, while frustrating, it's only a minor blemish on what is (for my money), the best game release for 2010. . . so far.

AVAILABLE PLATFORMS
PS3
XBOX 360

CONTACT Rockstar
ONLINE www.rockstargames.com
PRICE $109.95

✔ Lengthy, engaging single player campaign; great story.

✖ No character customisation; legacy GTA bugs.

VERDICT ★★★★★

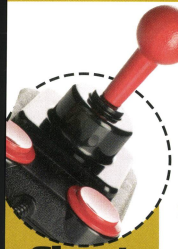








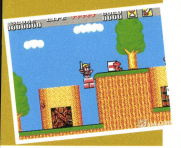




Classic Game

WONDER BOY IN MONSTER LAND

Proving that sequels sometimes kick arse over the original release is none other than Wonder Boy in Monster Land (WBML). Gone is the prehistoric game world, cheesy music, axe throwing and skateboard; instead our intrepid hero wanders a medieval fantasy world wielding a sword, on a mission to save the land from a gigantic robot dragon. WBML was probably the earliest game I played with RPG elements involved. Most killed creatures dropped coins of varying values which could be used to buy new loot as you went. Another excellent feature — and a daunting one by the time you got there — was the inability to continue the game once on the final level. A fantastic version is available to download and play on the Wii via the Virtual Console (and will only set you back 500 points). Relive one of my old favourites today.





Monster Hunter Tri

Peter Dockrill joins the hunt.

At time of writing, it's been more than three and a half years since the local release of the Wii. Further to this, Nintendo recently committed to the first-ever Wii price cut, slashing $100 off the retail cost (whereas Microsoft and Sony have been aggressively undercutting for years). What does this tell us? Well, in a nutshell, it squarely places us in the latter portion of the Wii's lifespan – which is an interesting place to be. While most of Nintendo's first-party games have already made their big-splash appearances on the console, the period that remains will see developers squeeze ever-more performance out of the Wii's ageing hardware. One title currently receiving much kudos overseas in this regard is Super Mario Galaxy 2. But another is Monster Hunter Tri. Developed by Capcom, it's a beautiful, ambitious, multi-faceted adventure and fighting game that shows the kind of polish and attention to detail which launch titles are generally ineligible to receive. You're a monster hunter, charged with defending a village from the monstrous creatures that trouble them. Sure, it *sounds* like any other game, but the living, breathing feeling of the environment (and your prey) elevates MHT to something greater. Online (and offline) multi-player is a huge value add (as is the Classic Controller Pro, bundled with the title). Recommended. But not for vegetarians.



AVAILABLE PLATFORMS

Wii

- CONTACT Nintendo
- ONLINE www.nintendo.com.au
- PRICE $89.95

✔ Huge game; nice graphics; online multi-player; lots of monsters.

✖ Opening tutorials and intro segments a bit tiresome.

VERDICT ★★★★☆







AVAILABLE PLATFORMS

XBOX 360

- CONTACT Microsoft
- ONLINE www.alanwake.com
- PRICE $99.95

✔ Atmospheric; great lighting.

✖ Too linear; too many genre clichés.

VERDICT ★★★½☆

Alan Wake

Troy Coleman struggles to retain editorial control.

Players assume the role of Alan Wake, a horror writer in the midst of severe writer's block, who heads off to the town of Bright Falls with his wife to get away from it all for a while. Unfortunately, Bright Falls isn't the idyllic vacation spot intended, as Alan finds himself desperately trying to locate his wife after she mysteriously disappears.

Gameplay is split up into a series of incredibly linear episodes that take place predominantly at night. Lighting, by deduction, plays quite a major role and, not only is it technically excellent (and the highlight of the entire game... boom-tish), it also serves as a weapon against the 'darkness' surrounding the mystery at hand. Armed with a torch, a weapon and his wits, Alan ventures forth into the surrounding wilderness, and along the way is attacked by a number of shadows and (seemingly) possessed individuals called the 'Taken'.

If nothing else, Alan Wake serves as a fantastic compendium of cringe-worthy 'horror / psychological thriller' clichés. Objects will move of their own accord. Televisions will mysteriously switch on and project haunting images of a future self. Someone will always attack you with a chainsaw. During the daylight hours is never an appropriate time to investigate the abandoned milling yard; it's definitely best to go in the dead of night. Alone. And I'm pretty sure a teenage couple is making out down by the lake.

Command & Conquer 4: Tiberian Twilight

Troy Coleman is in your base for the last time.



AVAILABLE PLATFORMS

PC-DVD | ~~WII~~ | ~~PS3~~ | XBOX 360 | ~~PSP~~

CONTACT Electronic Arts
ONLINE commandandconquer.com
PRICE $89.95

✔ Distinct class choices are quirky and add distinction.

✖ Requires constant Net access; core gameplay changes FTL.

VERDICT ★★★½☆

And so, a series that has spanned well in excess of a decade comes to a close with a thud. A soft yet clearly audible 'meh' resounds from our lips. Tiberian Twilight (TT) takes place 10 years after the close of Kane's Wrath and sheds a little more light on the origins of Kane, his hopes, dreams and ultimately his burning desire to leave the Earth by using the Threshold 19 (an interstellar portal). Fairly early on, the single-player campaign splits and players decide to follow either the GDI or the Brotherhood of Nod – both tell the same story but from different perspectives, which is quite nice. Digging a little deeper, players choose one of three distinct classes: offence (tank-based frontline units), defence (infantry and base defences) and the support class (which comprises air and vehicles). One of the fundamental processes of the Command & Conquer gameplay was the necessity to gather resources in order to build game assets to ultimately punch the air and shout "I win". This has been simplified somewhat in TT, where players now need only capture (and retain) 'resources nodes', which are scattered across each map. The more nodes under player control, the more points are accumulated over time. Campaign battles seem to have been scaled back somewhat in comparison to 3; epic multi-front battles of old are reduced more or less to a series of smaller single-force led skirmishes. Not a great finish to a long-standing franchise. Oh, and the fact that an internet connection is required *at all times* – even in offline game modes, just isn't cool.



GOODBYE KANE!
The last in the Command & Conquer series comes to a close.

Videomate HD Experience, Simply Brilliant



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- Day and night functionality for any lighting condition
- High Quality Megapixel/HD Image
- H.264 , MPEG-4 and MJPEG compression
- Smart motion dection without risk
- Built-in MIC/Speaker to Capture/Send suspicious voice
- Monitor from 3GPP & iphone/BlackBerry mobiles
- 32 channels ComproView™ bundled
- MicroSD card slot for local snapshot storage



■ Wireless upgrade module available

IP540 Network Camera

- Pan/Tilt with 4x digital zoom
- Day and night function, operates under all light condition
- Supports Dual H.264, MJPEG or MPEG-4 video streams
- Supports dual streams simultaneously
- Two way audio with built-in MIC
- Support UPnP (Universal plug and play)
- Supports local storage (MicroSD)
- Bundle with powerful 32-channel IP video management software



■ Wireless upgrade module available



VideoMate E750

- PCIe interface & certified with Windows7
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- PIP/POP feature up to 5 TV windows watching
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- Windows Media Center remote control

Windows 7



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iPadapps
Recommended...

MULTIPONG — $3.99
Four-player competitive pinball action — on the same iPad — really doesn't get much better than this. Head over to the Fingerlab web site to check out a gameplay video and, as usual, head over to the App Store to access the download. **www.fingerlab.net/multipong/**

SCRABBLE — $12.99
Losing none of the charm — or pieces — from the boarded version, Scrabble for the iPad allows players to hone their word skills solo or play up to four players wirelessly over a local network. The absolute kicker is the ability to use the iPad as the main game board and then utilise an iPhone or iPod touch as a personal tile rack. Head to **www.ea.com/au/game/scrabble-ipad** to check it out.



PLANTS VS ZOMBIES — $12.99
It's completely unknown why Plants vs Zombies (PvZ) is extremely expensive when compared to its iPod touch/iPhone version, but great gameplay none the less. PvZ is more or less a turret defence game: players need to defend their home from a zombie attack by using an assorted arsenal of plants. More information and a gameplay video can be found at the Pop Cap web site. **www.popcap.com/games/pvz**



We look at a range of games for your iPhone that you can buy for under $20.

GUITAR HERO - $3.99
Is there a platform Guitar Hero doesn't feature on? To be honest, playing the series on the major consoles has worn a little thin with me, but on the iPhone it brings with it a certain charm so that it's almost cool again. The cover charge gets you six tracks from the likes of Queen, The White Stripes, Weezer and some band called the Rolling Stones. Three-track add-on packs are also available for an additional $2.49 a pop. Building a library of tracks to play could quickly become expensive.

SOLOMON'S KEEP - $1.19
A fantastic Diablo-esque dungeon crawler. Playing as a wizard with a choice of three different power-bases — fire, lightning or magic missile — you head down into randomly generated dungeons and rid them of the lurking evil. The directional controls are a bit funky at first but quickly become second nature.

LEAP SHEEP! - $2.49
Although there is nothing revolutionary about the gameplay in Leap Sheep! (sheep run at a fence, pushing makes the sheep jump, pushing again makes them do tricks), what's cool is where it comes from. This is the first iPhone game from developers Turtle Rock Garage, who also had a hand in the development of Left 4 Dead. Who else can see what's coming? Zombie sheep. . . awesome.

CUBED RALLY RACER - $2.49
The cutest — and clearly most annoying — racing game you'll ever play, Cubed is a simple point A to B racer delivered from a 3D isometric viewpoint. Make certain to pick up fuel as you go. . . and don't hit the cows.

GLASS TOWER - $1.19
Physics-based games always get me excited — throw in some simulated gravity and I get my real geek on. The idea is to clear all but the red blocks.

HECTOR: BADGE OF CARNAGE EP 1 - $4.99
This is not an app to let the kids play. On the expensive side — especially for episodic content — Badge of Carnage thrusts players into the seedy world of Clapper Wreake as a hostage crisis threatens the city's finest. Hilarious.

TUMBLEDROP - $2.49
Tumbledrop's beautifully simple candy-coloured characters and landscapes have an immediate charm. Couple that with the simple goal of keeping the star safe — and you're onto a winner.

Topfive
Racing games...



01

GRAN TURISMO 5 PROLOGUE
A driving showroom in your own home. Vehicles (and driving simulations) don't look or feel better than this.



02

COLIN McRAE: DIRT 2
Insanely fast, edge of the seat — and cliff — rally and offroad action.



03

MIDNIGHT CLUB 3: DUB EDITION
Open-world street racing at its finest. Midnight Club LA on PS3 may look a little shinier, but the insane difficulty of LA is what punched it out of Top 5 contention.



04

MARIO KART DS
Competitive, easily digestible and portable — the Nintendo DS release of Mario Kart is the thoroughbred in the Kart racing stable.



05

FORZA 3
Great-looking racing with a gobsmacking package of content available, with around 400 driveable vehicles on over 100 track variations.



A WAR OF WORDS

"Shoot first, ask questions later" is the old saying, but if you get your voice comms right you'll be doing both at the same time. **Bennett Ring** explains the importance of battlefield VoIP.

Over the last couple of issues, *APC* has prepared you to enter the virtual battlefield of our Shock and Awe tournament with a series of articles teaching you how to not just stay alive – but to crush your foes into the dirt. Today's tutorial is one of the most important, discussing a matter at the core of any successful online team – Voice over IP (VoIP), commonly referred to as voice comms. To co-ordinate your squad there is nothing better than talking to each other; in the time it takes you to type the words "Incoming sniper fire from the large barn on the horizon", half of your squad have already been riddled with bullets, while the other half have fled in every direction of the compass. Using your voice to communicate with squad mates is far more efficient and timely, so we're going to show you how to do this effectively. We've also taken a look at today's most popular gaming VoIP applications, so that you can choose the program most suitable for your Band of Binary Brothers. The good news is that they're all free to download.

VoIP CLIENT/SERVER MODEL

Regardless of which VoIP application you choose, when your team uses VoIP there are two things each player needs to do:

1 Every player must have the VoIP client installed and – most importantly – working properly on their gaming PC. We've experienced first-hand the pain of lazy players who install a VoIP client five minutes before a match is scheduled to commence, only to discover that it's causing their PC monitor to display a lovely shade of deep blue. Make sure every player has installed *and tested* the VoIP software several days in advance of your match.

2 Every player must then join a VoIP server. These are supplied for free by ISPs, although your clan will usually have to pay to get their own private area – known as a channel – set up away from listening enemy ears. However, our ISP partner for the Shock and Awe tournament, Internode's games.on.net, is offering to set up these channels for free – provided you're using TeamSpeak.

3 Simply go to the following page and fill in the form, ensuring you include a contact email as part of your message: **http://games.on.net/pages.php?page=ts**.

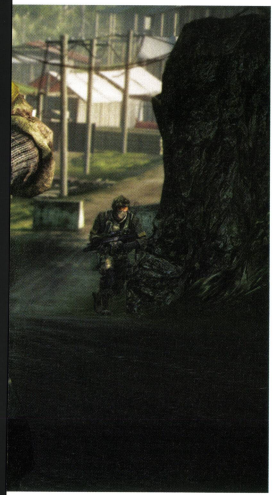
Another option is to host your very own VoIP server – but this is not recommended for newcomers to online gaming (and is outside of the scope of this article).

CHANNELS

During large clan wars, where both teams have more than ten players per side, it's wise to break your private VoIP channel into smaller sub-channels. If you don't, prepare for your channel to be flooded with an unintelligible mess of screaming gamers as soon as the shrapnel starts flying.

However, as our tournament matches are comprised of smaller eight-player teams, we recommend keeping all troops in the one channel – with one proviso: *each player must practice strict radio discipline*.

Even just eight excitable soldiers can overpower a single comms channel faster than you can say "Please repeat that last



COMMON RADIO TERMS

"FRAG OUT" Used when throwing a grenade.

"MEDIC" To call the Medic class over to revive you.

"CLEAR" When clearing urban environments (and a room has been swept clean), call this out.

"OVER" Used at the end of your radio transmission.

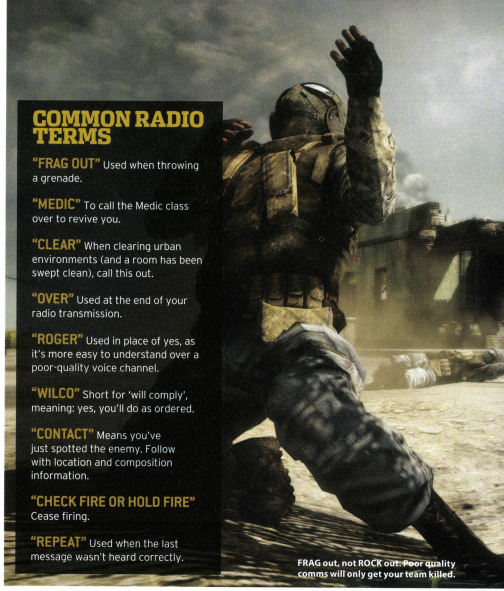
"ROGER" Used in place of yes, as it's more easy to understand over a poor-quality voice channel.

"WILCO" Short for 'will comply', meaning: yes, you'll do as ordered.

"CONTACT" Means you've just spotted the enemy. Follow with location and composition information.

"CHECK FIRE OR HOLD FIRE" Cease firing.

"REPEAT" Used when the last message wasn't heard correctly.



FRAG out, not ROCK out. Poor quality comms will only get your team killed.

order". But what is radio discipline? We're glad you asked.

RADIO DISCIPLINE: THE ABC OF COMMUNICATIONS

Our tournament simulates modern infantry warfare (with a few creative licenses) so what better way to communicate during these battles than the same way real infantry communicates? And at the heart of military communication is the ABC of Communications:

ACCURACY. Make sure what you're saying is accurate, so you don't need to correct yourself. Think about what you're going to say before you say it.

BREVITY. This is arguably the most important part of any comms. Keep your communications succinct and to the point. Do not talk unless you absolutely have to. You can tell your squaddies when you've spotted an enemy or need support – but don't clog up the chat channel with information about how tasty your lunch was.

CLARITY. Thankfully today's VoIP applications offer excellent sound quality, but some clan members may have poor microphones or slower net connections. These can combine to make it sound like you're chatting to them over a pair of cans connected with string. To help prevent this being a problem, make sure you enunciate all commands slowly and clearly.

The trickiest of the three is brevity – it's imperative that you get your message out in the shortest, clearest way possible. Most of the time you'll be calling out where enemy contacts are – the best way to do this is to provide the heading, distance and composition of enemy forces. For example:

"Contact, north east, two hundred metres, three riflemen, one possible anti-tank troop, over." This sentence takes about five seconds to say, but tells your team that there is a relatively large force in a specific location, and that it's probably not wise to send your tank in to investigate, lest it gets turned into a smouldering steel box of doom.

LANDMARKS

While using the above method of calling out a contact works fine for people in your close vicinity, it's not very helpful for team mates on the other side of the map. How are they supposed to know what's 200 metres away from you when they have no idea where you are? This is where landmark names prove to be very handy.

Download one of the top-down maps of each level, available here: **http://games.on.net/file/34415/Battlefield_Bad_Company_2_-_Map_Kit**. Using Paint or Photoshop, give each major area or point of interest on the map a unique nickname, preferably something that makes sense and is easily recognisable. Distribute the map to your clan and ensure they memorise the area names before the match - this way they can point out exactly where contacts are, in a way that makes sense regardless of where you are positioned. For those with bad memories, it's easy to print out the map with landmark names and post it next to your monitor, allowing for quick reference in the heat of battle.



VOIP HEAD-TO-HEAD

There are three main VoIP applications used by clans. While at their core they all do the same thing – allow clan members to speak to each other – the way they go about it is very different from one package to the next. We've taken a look at all three so you know which one is the best for your needs.

VENTRILO

Score: **3/5**

URL: **www.ventrilo.com**

This small 3.2MB freeware VoIP application used to be one of the most popular, and for very good reason – voice quality. Just a year ago, Ventrilo had by far the best voice quality of the three programs that we're looking at today. The first time we tested Vent with friends, we were astonished to hear the amazing sound quality. When paired with a decent microphone and speakers, Ventrilo makes it sound as if the person you're chatting to is actually in the same room as you – it's that good, far surpassing the quality of a regular phone call. However, the competitors have since caught up, especially TeamSpeak 3, which offers just as good audio quality over a wider range of codecs.

Where Ventrilo falters is its archaic interface. There's no setup wizard to hold your hand through the myriad of settings. This is fine if you know the difference between a Default Wave Mapper and a Hardware Input Mixer, but a little confusing for those of us who didn't attend audio engineering school. To be blunt, it's also a little ugly – not cool in this day of shiny icons and Web 2.0 functionality. There are also fewer Ventrilo servers out there, making it harder to get a private channel set up for your clan. So it's a solid VoIP application, just not the best.

MUMBLE

Score: **4/5**

URL: **http://mumble.sourceforge.net**

Mumble is the cool new kid on the block, built by a bunch of techies who weren't happy with the other applications out there. Like the other two, this 12.2MB download is currently free of charge to download. Installation looks very complex, with lots of big techie words that are initially rather scary. Thankfully, the wizard does a great job of explaining them all, and you'll have it set up and running in no time.

Sound quality is excellent, but that's not Mumble's killer feature. It's the fact that this software can do positional audio. Provided the game you choose to play is supported by Mumble, with a little tweaking you can make the speech of your clan mates actually come from their in-game avatar. The further they move away from you, the less you can hear them. If they're behind you, they'll sound as if they're behind you. It's a very cool feature but does require quite a bit of tinkering to get to work, making Mumble best left to the VoIP pros. If you do choose to use Mumble, games.on.net has a free server for your use at **mumble-1.games.on.net**.

TEAMSPEAK 3

Score: **5/5**

URL: **www.teamspeak.com**

And now to our favourite VoIP application for gamers. TeamSpeak has been around the longest of the three, and version 3 incorporates all of the lessons the team has learnt over the years. It's an incredibly powerful and flexible VoIP system, but for your use you'll only need to stick with the basics.

Like Vent, the 12.4MB free download has a setup wizard, helping you to choose which devices to use for recording and playback, and testing your setup as you go. From there it's simply a matter of joining a TeamSpeak 3 server (such as the one at **teamspeak.games.on.net**) and chatting with your pals. As mentioned earlier, Internode and games.on.net are happy to set up a private, password-protected channel for your clan – simply head to **http://games.on.net/pages.php?page=ts** and lodge your application. TeamSpeak is as easy or as complex as you want it to be, and has arguably the widest range of compatibility across sound devices. Our pick of the bunch. GTTC

downtime

HIGH-PERFORMANCE PLAYTIME



01 KODAK PULSE DIGITAL FRAME

This touchscreen-enabled frame is equipped with Wi-Fi connectivity and a personal email address so you can display your photos without any wires. Better still, you can also send pictures to the frame via Facebook or any device that has email capability. When linked to your Facebook account, the frame will automatically update and display photos as you and your friends post them online. The 7in screen – although not HD – looks good despite its 800 x 600 resolution. The frame has 512MB of internal memory, which can hold around 4,000 average-sized photos, which should be plenty for most users. ***CZ***

- CONTACT Kodak
- ONLINE www.kodak.com.au
- PRICE $179

02 FLPR UNIVERSAL REMOTE

FLPR... (no, it's not a dolphin) turns your iPod/iPhone into a universal remote that can control everything from your TV to your stereo to your lights via the combination of an iPhone app and a small piece of hardware. As long as it works with an infra-red remote, you can control it via a plug-in infra-red sensor and accompanying app. Once the app is launched, choose the device type you want to control, select the brand, name it and you're off. FLPR comes pre-programmed with over 14,000 remote control codes, including all major electronics brands, so there's no pairing necessary. ***CZ***

- CONTACT iWorld
- ONLINE www.iworldaustralia.com.au
- PRICE TBA

03 IPHONE ILUV APP STATION

iWorld has really come good with its range of iPhone accessories of late. One of the most impressive is the iLuv app station that turns your iPhone into an alarm clock while it charges overnight. What is essentially a powerful compact speaker with a sideways mounted dock, the app station works in conjunction with its own app to turn your iPhone/iPod touch into a kick-arse alarm clock that can wake you up with your choice of either music or video. Best of all, it can run off 6 x AA batteries, so it's completely portable and usable as either the clock or a standard speaker dock. ***CZ***

- CONTACT iWorld
- ONLINE www.iworldaustralia.com.au
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04 SANDISK 32GB MICRO SD CARDS

With smartphones fast becoming the mobile computing device of choice, we can imagine a lot of readers out there will be happy to hear that SanDisk has just released a Micro SD card that is the biggest yet. With a whopping 32GB of memory, smartphone users can go nuts and download all the apps they have previously drooled over due to limited storage space. The increase in size to 32GB doubles the previous best but comes with one catch... a premium price of $199. Although it may not be cheap, the 32GB SanDisk Micro SD card's size will prove a priceless addition to the technophile's tech collection. ***CZ***

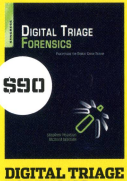
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DIGITAL TRIAGE FORENSICS
www.elsevierdirect.com

This book is as much an interesting read as it is informative. *Digital Triage Forensics* (DTF) is a procedural model for the investigation of digital crime scenes including both traditional crime scenes and the more complex battlefield crime scenes. The United States army and other traditional police agencies use this model for current digital forensic applications.



CONTACT MiShare
ONLINE www.mishare.com
PRICE US$99.50

MiShare
Swap songs with anyone, anywhere!

Apple does its best to ensure that us evil, thieving consumers can't illegally access unpaid-for content. So it comes as a surprise to see a product that is designed and sold for the sole purpose of sharing music and video content. The MiShare is a small device that connects two iPods together and enables them to swap music or video files without fancy hacking software and convoluted processes. It works with every make of iPod except for the shuffles and the iPod touch, although the makers promise that a patch is on the way to make it compatible with iPod touch (and all makes of iPhone) in the near future.

The first thing to note with this product is that it only works with files that aren't DRM-protected, so any such content you've purchased from the iTunes store won't be transferrable. Anything else is up for grabs. To make a 'swap' all you need to do is copy the files you want to share into the 'On the Go' playlist folder on your iPod before connecting it to one end of the MiShare via the docking connector. Plug another iPod into the other end, hit the green button on the MiShare and wait. An average music track takes 10 seconds to copy over at full USB 2.0 speeds. The overall process takes a few minutes but can be done anywhere, at anytime, without the need for a PC.

Christopher Zammit

BLU-RAY PICKS OF THE MONTH



CONTACT Sony Pictures
ONLINE www.sonypictures.com.au
PRICE $32

THE MEN WHO STARE AT GOATS

Not quite an all-out comedy, *The Men Who Stare At Goats* is a very funny film that takes a sideways glance at some darker subjects along the way. Namely covert military operations, torture and the Iraq war. The film follows Bob Wilton (Ewan McGregor), a young reporter who stumbles onto the story of a lifetime when he meets Lyn Cassady (George Clooney), who claims to be part of a psychic military unit. With multiple references to Jedi and obscure super powers, the two men set off on a covert mission, of which neither of them know the objective. ***CZ***



CONTACT Universal Pictures
ONLINE universalpictures.com.au
PRICE $39

GREEN ZONE

This is a film that deals with what some people suspected about the 'invasion' of Iraq: that the hunt for weapons of mass destruction was an excuse for a US military takeover of the oil-rich country. For Roy Miller (Matt Damon), a US military officer tasked with finding the weapons in the early days of the war, discovering this turns out to be dangerous to his health. The conspiracy theorists will love this film. Part psychological thriller, part chase film, *Green Zone* is a war movie with a hell of a twist. ***CZ***



CONTACT Warner Brothers
ONLINE www.warnerbros.com.au
PRICE $39 with bonus digital copy

CLASH OF THE TITANS

With his recent success, some would say Sam Worthington is a god. . . and, in *Clash of the Titans*, he is. Worthington plays Perseus, a god raised as a man who finds himself in the middle of a coup between Hades (Ralph Fiennes) and Zeus (Liam Neeson). As these two super-beings slug it out, using Earth as a giant boxing ring, Perseus takes it upon himself to step in and stop Hades. Filled with a wide variety of monsters, demons and the like, *Clash of the Titans* is a fun adventure film that is visually stunning but slightly lacking in the plot department. Still, well worth a look. ***CZ***



chipchat

BY PETER [illegible]



Hacking: A History

It's not every day that historically significant steps are taken in the march toward technological anarchy, so it's nice to have a refreshing primer on the History of Hacking (**bit.ly/haNbp**), kindly provided by the folks at focus.com. Starting with the first computer hackers emerging from MIT in the sixties, this online chronicle traces the development of cyber-terrorism and malware in both tech and popular culture, covering Phone Phreaking (1971) through to the introduction of hacking to the mainstream audience via the Matthew Broderick movie *War Games* (1983) and on to more recent malware milestones. Interesting reading!

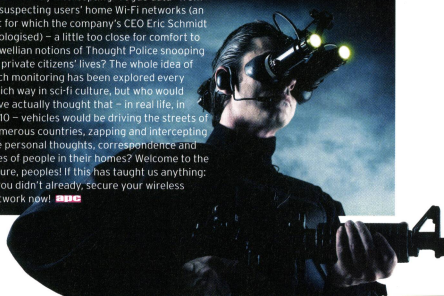


Nine steps to social networking dominion

Mark Zuckerberg. Ten years ago, who was he? A scrawny, white dweeb? Check. Fast-forward ten years and. . . well, okay, some things haven't changed, but he *is* the master of all things social networking in the (current) known universe. But is it time for a regime change? (Hinted at last month.) Well, maybe. Techi.com has suggested a nine-step guide to beating Zuckerberg at his own game (**bit.ly/c1OZUE**). Step 1 is crafting a social networking concept and Step 9 is retiring (with obscene riches), and in the middle somewhere you get uber-powerful by deploying and monetising an as-yet-unseen Facebook/Twitter/MySpace-killer. Doesn't sound too hard. . .

Google's very own Thought Police?

Is it just me, or is the whole recent Google PR debacle – whereby Google Street View photography vehicles were caught out inadvertently intercepting "rogue data" from unsuspecting users' home Wi-Fi networks (an act for which the company's CEO Eric Schmidt apologised) – a little too close for comfort to Orwellian notions of Thought Police snooping on private citizens' lives? The whole idea of such monitoring has been explored every which way in sci-fi culture, but who would have actually thought that – in real life, in 2010 – vehicles would be driving the streets of numerous countries, zapping and intercepting the personal thoughts, correspondence and lives of people in their homes? Welcome to the future, peoples! If this has taught us anything: if you didn't already, secure your wireless network now! PBC



fractal design

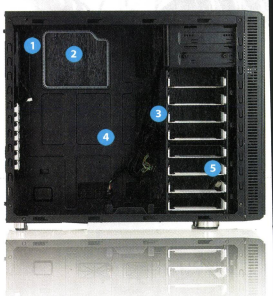
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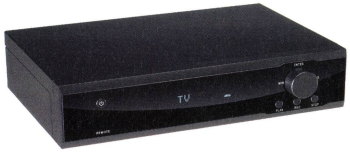
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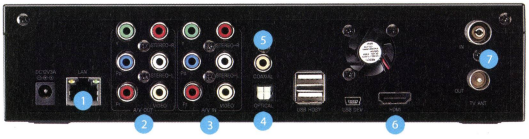
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FO-15CR	$ 44.00	$ 21.00

Epson Toner Cartridges

Model	Genuine	TONNY
EPL-5700/5800	$196.00	$ 49.00
EPL-5900/6100	$213.00	$ 49.00
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AL-C900/1900BK	$102.00	$ 65.00
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AL-CX11N/C1100BK	$107.00	$ 39.00
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AL-C1000/2000BK	$124.00	$ 99.00
AL-C1000/2000C/M/Y	$249.00	$115.00

Panasonic Thermal Film

Model	Genuine	TONNY
KX-FA54E	$43.00	$18 Twin Pack
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KX-FA134	$82.00	$35 Twin Pack
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Lexmark Toner Cartridges

Model	Genuine	TONNY
Optra E/E+	$ 142.00	$ 59.00
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E230/232/330/332	$ 129.00	$ 55.00
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Model	Genuine	TONNY
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T038	$20.00	$ 5.00
T039	$28.40	$ 5.60
T0461	$22.00	$ 4.50
T0472/3/4	$14.90	$ 4.50
T0491/2/3	$21.00	$ 4.50
T0494/5/6	$21.00	$ 4.50
T0621	$22.00	$ 5.20
T0631	$16.00	$ 5.20
T0632/3/4	$15.20	$ 5.20
73N BK (T0731)	$17.00	$ 6.80
73N C/M/Y (T0732/3/4)	$17.00	$ 6.80
81N BK (T0811)	$27.00	$ 6.80
81N C/M/Y (T0812/3/4/5/6)	$27.00	$ 6.80
S020089 / T052	$35.10	$ 4.80
S020093/ T050	$29.00	$ 4.80
S020187/T050	$28.00	$ 4.80
S020189/ T051	$32.00	$ 4.80
S020191 / T052	$34.00	$ 4.80

Canon Ink Cartridges

Model	Genuine	TONNY
BX-3	$47.00	$23.10
BC-05	$59.60	$26.70
BC-20	$62.00	$22.90
PG-40	$34.00	$25.00
CL-41	$35.00	$26.00
PG-50	$38.00	$27.00
CL-51	$42.00	$29.50
BCI-3eBK	$22.70	$ 6.40
BCI-3eC/M/Y	$20.40	$ 5.70
BCI-6BK	$24.10	$ 5.70
BCI-6C/M/Y	$24.10	$ 5.70
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CLI-8C/M/Y with chip	$22.50	$ 7.40
PGI-5BK with chip	$22.50	$ 7.40
BCI-15BK	$24.90	$ 6.10
BCI-16C	$40.70	$ 6.30
PG-510	$24.10	-
CL-511	$27.40	-
PG-512	$33.80	-
CL-513	$33.50	-
PGI520BK	$19.30	$ 7.80
CLI521BK/C/M/Y/GY	$19.30	$ 7.80
BCI-24BK	$15.30	$ 5.60
BCI-24C	$31.00	$ 5.90



Samsung Laser Toner

Model	Genuine	TONNY
SCX-4100D3	$123.00	$ 49.00
SCX-4216D3	$123.00	$ 49.00
SCX-D4200A	$123.00	$ 49.00
SCX-4521D3	$126.00	$ 49.00
SCX-D4725A	$123.00	$ 64.00
SCX-5312D6	$ 96.00	$ 70.00
SF-5100D3	$123.00	$ 49.00
ML-1210D3	$123.00	$ 49.00
ML-1610D2	$114.00	$ 49.00
MLT-D108S	$ 95.00	$ 55.00
MLT-D209L	$145.00	-
ML-1710D3	$123.00	$ 49.00
ML-2010D3	$113.00	$ 49.00
ML-2150D8	$219.00	$ 82.00
ML-2250D5	$144.00	$ 59.00
ML-D3050B 8k	$288.00	$ 86.00

Lexmark Ink Cartridges

Model	Genuine	TONNY
18C0781A (#1)	$36.90	$24.60
10N0016 (#16)	$49.30	$18.40
15M0120 (#20)	$63.60	$24.00
18L0028 (#28)	$53.00	$23.00
18C0032 (#32)	$36.90	$21.30
18C0033 (#33)	$39.80	$23.10
18C0034 (#34)	$41.60	$25.00
18C0035 (#35)	$49.30	$27.00
18Y0143A (#43XL)	$49.30	$25.00
18Y0144A (#44XL)	$41.60	$27.00
12A1970 (#70)	$55.90	$21.00
18L0032 (#82)	$50.20	$26.10
18L0042(#83)	$62.60	$23.90

Brother Ink Cartridges

Model	Genuine	TONNY
LC-37BK	$25.20	$ 5.00
LC-37C/M/Y	$16.60	$ 6.50
LC-38BK	$24.50	$ 5.00
LC-38C/M/Y	$15.90	$ 6.50
LC-47BK	$34.60	$ 5.00
LC-47C/M/Y	$20.80	$ 6.50
LC-57BK	$34.50	$ 5.00
LC-57C/M/Y	$20.80	$ 6.50
LC-67BK	$34.50	$ 5.00
LC-67C/M/Y	$20.80	$ 6.50

HP Ink Cartridges

Model	Genuine	TONNY
C8727WA (#02BK)	$28.20	$10.00
C8771Z/3/4/5WA (#02C/M/Y/LC/LM)	$16.60	$ 7.20
C6615DA(#15)	$42.40	$14.10
C4936A (#18BK)	$30.00	$16.00
C3967/8/9A (#18C/M/Y)	$23.50	$16.00
C9351AA (#21)	$24.00	$16.00
C9352AA (#22)	$27.30	$21.00
C8727AA (#27)	$28.90	$14.10
C8728AA (#28)	$33.00	$22.00
51645AA (#45)	$44.70	$16.00
C6656AA (#56)	$30.60	$15.20
C6657AA (#57)	$48.90	$23.00
C6658AA (#58)	$38.80	$23.00
CC641WA(#60XL) BK	$45.90	$21.00
CC644WA(#60XL) Color	$51.00	$23.00
CB336WA(#74XL)	$44.80	$20.00
CB338WA (#75XL)	$49.80	$21.00
C6578DA (#78)	$48.80	$18.00
C9396A (#88 BK)	$49.60	$16.00
C9391/2/3AA(#88C/M/Y)	$36.40	$15.00
C9362WA (#92)	$23.20	$11.00
C9361WA(#93)	$30.00	$12.50
C8765WA(#94)	$31.30	$11.00
C8766WA(#95)	$36.40	$12.50
C8767WA (#96)	$44.80	$11.00
C9363WA(#97)	$50.20	$12.50
C9364WA (#98)	$26.40	$12.50
C9369WA (#99)	$37.60	$14.50

Kyocera Toner Cartridges

Model	Genuine	TONNY
TK-16H	$ 73.00	$61.00
TK-17	$103.00	$ 35.00
TK-18	$123.00	$ 38.00
TK-310	$130.00	$ 59.00
TK-510K	$ 98.00	-
TK-510C/M/Y	$172.00	$145.00

Panasonic Toner Cartridges

Model	Genuine	TONNY
UG-3313	$242.00	$ 73.00
UG-5545	$242.00	-
KX-PDP8 Toner for KXP7100/7110	$136.00	$ 68.00

HP Color Toner

Model	Genuine	TONNY
CB540A	$109.00	$ 65.00
CB541/2/3A	$ 99.00	$ 65.00
Q6000A	$116.00	$ 65.00
Q6001/2/3A	$126.00	$ 65.00
Q3960A/C9700A	$126.00	$ 65.00
Q3961/2/3A	$151.00	$ 65.00

Samsung Color Laser Toner

Model	Genuine	TONNY
CLP-300A BK	$ 83.00	$ 25.00
CLP-300A C/M/Y	$ 73.00	$ 25.00
CLP-350BK	$ 91.00	$ 35.00
CLP-350C/M/Y	$ 80.00	$ 32.00
CLP-409S BK	$ 74.00	$ 55.00
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Konica Minolta Color Laser Toner

Model	Genuine	TONNY
QMS Magicolor 2300/2350 BK	$121.00	$ 65.00
QMS Magicolor 2300/2350 C/M/Y	$161.00	$ 65.00
QMS Magicolor 2400W/2430DL/2450 BK	$119.00	$ 65.00
QMS Magicolor 2400W/2430DL/2450 C/M/Y	$164.00	$ 65.00

HP Ink Cartridges

Model	Genuine	TONNY
CB321WA#564XL BK	$ 39.00	$ 17.00
CB322WA#564XL PB	$ 25.40	$ 16.00
CB323WA#564XL C	$ 25.40	$ 16.00
CB324WA#564XL M	$ 25.40	$ 16.00
CB325WA#564XL Y	$ 25.40	$ 16.00

NEW

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Model	Genuine	TONNY
TN-2025	$ 86.00	$ 49.00
DR-2025	$ 156.00	$ 62.00
TN-2150	$ 88.00	$ 49.00
DR-2125	$ 155.00	$ 68.00
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DR-3000	$ 215.00	$ 68.00
TN-3185	$ 128.00	$ 49.00
DR-3115	$ 236.00	$ 68.00
TN-3290	$ 159.00	$ 49.00
DR-3215	$ 209.00	$ 68.00
TN-6600	$ 117.00	$ 49.00
TN-7600	$ 122.00	$ 49.00
TN-8000	$ 47.00	$ 16.00
TN-04BK	$ 257.00	$ 89.00
TN-04C/C/Y	$ 257.00	$ 89.00
TN-12BK	$ 139.00	$ 72.00
TN-12C/M/Y	$ 281.00	$ 105.00
TN-155 BK	$ 139.00	$ 75.00
TN-155 C/M/Y	$ 196.00	$ 79.00

Samsung Color Cartridges

Model	Genuine	TONNY
CLP-510D7 BK	$142.00	$ 79.00
CLP-510D5 C/M/Y	$167.00	$ 79.00
CLP-600A BK	$131.00	$ 99.00
CLP-600A C/M/Y	$184.00	$105.00
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CLP-660/610A C/M/Y	$ 189.00	$105.00

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CART307BK(Q6000A)	$ 99.00	$ 65.00
CART307C/M/Y(Q6001/2/3A)	$ 105.00	$ 65.00

Model	Genuine	TONNY
CART 301 BK (EP87 BK)	$ 125.00	$ 77.00
CART 301 C/M/Y (EP87C/M/Y)	$ 140.00	$ 77.00
CART 318BK	$ 155.00	-
CART 331C/M/Y	$ 199.00	-
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FX-7	$ 139.00	$ 65.00
FX-9	$ 120.00	$ 49.00
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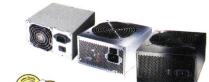
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300Mbps N Router with Gigabit Switch

4 Gigabit LAN Ports
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3T3R MIMO™, 3×3dBi Detachable Antennas
WEP, WPA/WPA2 encryption, "QSS" button



TL-WR941ND

3T3R 300Mbps N Router

BEST Quality/Price

4×10/100M LAN Ports
3T3R MIMO™, 3x3dBi Detachable Antennas
WEP, WPA/WPA2 encryption, "QSS" button



TL-WR841ND

300Mbps N Router

BEST Quality/Price

4×10/100M LAN Ports
2T2R MIMO™, 2x3dBi Detachable Antennas
WDS (wireless bridge)
WEP, WPA/WPA2 encryption, "QSS" button



TL-WR741ND/ TL-WR740N

150Mbps Wireless Router

BEST Quality/Price

WDS (wireless bridge)
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WEP, WPA/WPA2 encryption, "QSS" button



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BEST Quality/Price

Support SONY PSP X-LINK connection
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FREE DELIVERY

Billion BiPAC 7404VNPX ADSL2+ Firewall Router

The router that has it all - VOIP, 3G, ADSL2+, Wireless-N

- Dual WAN interfaces for ADSL2+ and 3G connections
- High-speed wireless connection up to 300Mbps data rate

WebCode: BIL0040



$126
Save $73

NETGEAR MBR624GU 3G Wireless Router

Share your 3G connection

- Wireless G with 4-Port switch
- Push 'N' Connect WiFi setup.
- Green energy saving

WebCode: NTG8221



$129
Save $60

NETGEAR DG834GV ADSL2+ Modem Router

All-In-One integrated voice gateway

- SPI Double Firewall
- 802.11g Wireless
- 4x 10/100 Ethernet ports

WebCode: NTG8007



$59
Save $90

Belkin Wireless G ADSL2+ Modem-router

Go wireless without breaking your budget.

- Ethernet, Fast Ethernet, IEEE 802.11b, IEEE 802.11g
- Wireless router + 4-port switch
- ADSL, ADSL2, ADSL2+

WebCode: BEL1154



$424
Save $216
FREE DELIVERY

D-Link DGS-1224T WebSmart 24-port Gigabit Switch

Create a high-speed Ethernet network with Gigabit capability

- Two combo SFP fiber connections
- Network security

WebCode: DLK9225



$44
NEW

Networking USB 2.0 Server

Share USB devices on your network

- USB 2.0, 1.1 Supported
- Windows 2000, XP, Vista compatible
- 10/100 Mbps
- Share USB printers and drives

WebCode: WIN2000



$108
Save $42

D-Link 1-port USB Print Server

Share your printer over a network

- Hi-Speed USB 2.0
- 10/100 Ethernet Port
- 2 Years warranty

WebCode: DLK4020



$209
Save $190
FREE DELIVERY

NETGEAR Stora MS2110 NAS Server With 1TB HDD

2 bay hot swap

- NETGEAR Stora Home Media Server for music, photos and videos
- Two (2) Serial ATA channels
- Compatible with SATA and SATA II HDD
- 10/100/1000 Gigabit Ethernet
- USB 2.0 port
- Embedded 256 MB flash memory for OS
- Powerful processor for fast transfer speeds and smooth media streaming
- Supports Windows, Mac, Linux/UNIX clients

WebCode: NTG8399



$319
FREE DELIVERY

QNAP TS-210 2-Bay NAS Server

Ideal for SOHO and Home Users

- RAID 0,1, JBOD
- Gigabit ethernet
- DLNA media server

WebCode: QNA0034



$1077
Save $178
HOT PRICE

QNAP TS-439 Pro II 4-Bay NAS Server

Superior Performance with iSCSI

- 1.6GHz Intel processor
- RAID 0, 1, 5, 6, 5+Spare, JBOD
- Surveillance station built-in
- Gigabit ethernet

WebCode: QNA0037



USB Display Adapter

WebCode: OTH0412



Logitech WebCam Pro 9000

WebCode: LOG3850



Microsoft Wireless Desktop 6000 V3

WebCode: MST8490



Microsoft Mobile Mouse 3500

WebCode: MST8548



Logitech R400 Presenter

WebCode: LOG3550



Universal AC/DC 100W Notebook Adapter

WebCode: HAV0001



Acer X193H 18.5" LED Monitor

- 5ms Response time
- 1366x768 Resolution
- 8000000:1 Contrast ratio
- 250 cd/m2 Brightness

WebCode: ACM0149



Samsung P2350 23" Full HD LCD Monitor

- 2ms Response time
- 1920x1080 Resolution
- 50,000:1 Contrast ratio
- 300 cd/m2 Brightness

WebCode: SAM2623



Acer X243H 24" Full HD Monitor

- 2ms Response time
- 1920x1080 Resolution
- 80,000:1 Contrast ratio
- 300 cd/m2 Brightness

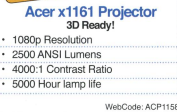
WebCode: ACM0152



Acer B273H - 27" LCD Monitor

- 5ms Response Time
- 1920x1080 Resolution
- 80,000:1 Contrast Ratio
- 300 cd/m2 Brightness

WebCode: ACM0433



Acer x1161 Projector

3D Ready!

- 1080p Resolution
- 2500 ANSI Lumens
- 4000:1 Contrast Ratio
- 5000 Hour lamp life

WebCode: ACP1158



Core i3 Gold System

- Intel Core i3-530 2.93GHz Processor
- 2GB DDR3 RAM
- 500GB Seagate SATA HDD
- 512MB nVidia Dedicated Graphics
- Windows 7 Professional 64-Bit
- Logitech MK250 Wireless Desktop
- 1 Year Pick up/Return Warranty

WebCode: WBX0001



Core i5 Platinum System

- Intel Core i5-650 3.20GHz Processor
- 4GB DDR3 RAM
- 1TB Seagate SATA HDD
- 1GB nVidia Dedicated Graphics
- Windows 7 Professional 64-Bit
- Logitech MK250 Wireless Desktop
- 1 Year Pick up/Return Warranty

WebCode: WBX0002



Core i7 Diamond System

- Intel Core i7-860 2.80GHz Processor
- 6GB DDR3 RAM
- 1TB Seagate SATA HDD
- 1GB ATi Dedicated Graphics
- Windows 7 Professional 64-Bit
- Logitech MK250 Wireless Desktop
- 1 Year Pick up/Return Warranty

WebCode: WBX0003

Kingston SSD*Now* V Series drive

Kingston TECHNOLOGY

Dramatically increase your performance of existing systems.



30GB SSD	KNM10604	**$149**
64GB SSD	KNM10389	**$239**
128GB SSD	KNM10390	**$379**
256GB SSD	KNM10599	**$949**

SSDNOW V SERIES

1.66GHz Intel Atom N450
1GB DDR2 RAM
160GB Hard Drive
Windows XP Home



$344
Save $357
LIMITED STOCK

ASUS 1001PX EeePC Netbook
6 Cell Battery - 11 Hours Battery life

WebCode: ASE0050

1.6GHz Intel Atom N450
1GB DDR2 RAM
250GB Hard Drive
Windows 7 Starter



$448
Save $51
FREE DELIVERY

Acer Aspire One 532 Netbook
Ideal for home and work

WebCode: ACE2150



$529
Save $52
FREE DELIVERY

1.66GHz Intel Atom N450
1GB DDR2 RAM
250GB Hard Drive
Windows 7 Starter

Lenovo S10-3
Sleek curves and smooth lines

WebCode: LEN0292

1.66GHz Intel Atom N450
2GB DDR2 RAM
250GB Hard Drive
Windows 7 Starter

MSI Wind U130
Built-in wireless b/g/n

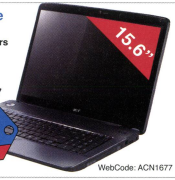


$458
Save $41
FREE DELIVERY

WebCode: MSI0130

2.13GHz Intel Core i3
2GB DDR2 RAM
320GB Hard Drive
Windows 7 Professional

Acer TravelMate 5740 Notebook
Ideal for business users

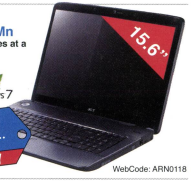


$677
Save $322
FREE DELIVERY

WebCode: ACN1677

2.13GHz Intel Core i3
2GB DDR2 RAM
500GB Hard Drive
Windows 7 Home Premium

Acer Aspire 5740-332G50Mn
All the latest features at a great price



$708
Save $91
FREE DELIVERY

WebCode: ARN0118



Lenovo Edge Thinkpad
Go anywhere in style!

$989
Save $130
FREE DELIVERY

1.3GHz Intel Core 2 Duo
2GB DDR2 RAM
320GB Hard Drive
Windows 7 Professional

WebCode: LEN0271

HP ML110 G5 Server
Perfect first server for a growing business

All the necessary server features in an affordable, functional package. A mix of PCI and PCI-Express slots delivers the expendability that a growing business requires. In addition, the ML110 G5 can be upgraded with the cost-effective HP Lights-Out 100c Remote Management card for remote sites or second offices.



$597
Save $1201
FREE DELIVERY

2.66GHz Intel Xeon X3330
1GB DDR2 RAM
160GB Hard Drive
DVD-ROM 48x

WebCode: HOS0500

Kingston TECHNOLOGY

Kingston system-specific memory is designed, manufactured and tested to the specifications of each brand name computer system. The design is fine-tuned to match the timing of the system, reduce noise and heat, and allow for the most efficient communication between the memory and the CPU.

To find out which RAM suits your PC best visit our Kingston Configurator online at www.citysoftware.com.au



citysoftware.com.au 1300 658 600

CITY SOFTWARE
Black Tie Service, Plain Wrap Prices



Canon PIXMA iP100 Portable Inkjet Printer

Portable printing solution

The rugged, compact iP100 Mobile Printer delivers remarkable quality and print-anywhere portability. Its patented print head technology and 5-color ink system let you create spectacular photos

- 20ppm Mono, 14ppm Colour
- 9600 x 2400 DPI
- USB, Infrared

WebCode: CAN0732

Black PGI-35	CAN8104	$15
Colour CLI-36	CAN8105	$32

Epson Stylus Office TX610FW Multifunction Inkjet

Laser speed & wireless networking

- 5760x1440 dpi Resolution
- 38ppm Colour & Mono
- USB, Ethernet 802.11b/g Wireless



WebCode: EPI6100

Black 73N	EPA5192	$16	Magenta 73N	EPA5392	$16
Cyan 73N	EPA5292	$16	Yellow 73N	EPA5492	$16



Epson Stylus TX810FW Colour Inkjet MFP

Fax / copier / printer / scanner

- 40 ppm Mono & Colour
- Up to 5760 x 4800 DPI printing
- USB 2.0, Ethernet, Wireless

WebCode: EPI8100

Black	EPA2192	$20
Light Cyan	EPA2592	$20
Light Magenta	EPA2692	$20
Cyan	EPA2292	$20
Magenta	EPA2392	$20
Yellow	EPA2492	$20



Epson Stylus Photo 1410 A3 Colour Inkjet

6 Individual ink catridges

- 5670x1440dpi Resolution
- 30ppm Mono & 17ppm Colour
- USB 2.0 Connectivity

WebCode: EPI1410

Black 81N	EPA9912	$27	Light Cyan 96	EPA6590	$23
Light Cyan 81N	EPA1592	$27	Light Magenta 96	EPA6690	$23
Light Magenta 81N	EPA1692	$27	Cyan 96	EPA6290	$23
Cyan 81N	EPA1292	$27	Magenta 96	EPA6390	$23
Magenta 81N	EPA1392	$27	Yellow 96	EPA6490	$23
Yellow 81N	EPA1492	$27			



Canon PIXMA MP640 Inkjet Printer

All-in-one printer - Wireless

- 9600x2400 dpi
- 5 Colour ink tanks
- CD & DVD Printing
- 3" TFT screen

WebCode: CNN0051

Black	CAN7000	$18
Grey	CAN7004	$18
Photo Black	CNN0022	$27
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18



Canon PIXMA iP4700 Inkjet Printer

Vibrant photos & documents at hom

- 9600x2400 dpi
- 1 Picolitre droplet
- CD & DVD Printing
- USB 2.0

WebCode: CNN005

Black	CAN7000	$18
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18



Canon PIXMA MP560 All-in-One Inkjet

Wireless-Ready multifunction inkjet

- 9600 x 2400 dpi printing
- 5 Colour ink tanks
- 2.0" TFT screen

WebCode: CNN0058

Black	CAN7000	$18
Grey	CAN7004	$18
Photo Black	CNN0022	$27
Cyan	CAN7003	$18
Magenta	CAN7002	$18
Yellow	CAN7001	$18



Brother MFC-6890CDW A3 Multifunction Inkjet

6-In-1 A3 printer

- Up to 6000 x 1200 dpi
- 35ppm Mono, 28ppm Colour
- 4.2" Touchscreen Duplex/Print/Fax
- Wireless-G, USB, Ethernet

WebCode: BRT0243

Black LC-67BK	BRT0304	$34
Cyan LC-67C	BRT0305	$17
Magenta LC-67M	BRT0306	$17
Yellow LC-67Y	BRT0307	$17



Epson Stylus Photo R2880 A3 Inkjet Printer

Individual Ink Cartridges

- 9ppm Colour & Mono
- 5760x1440 dpi Resolution
- USB 2.0 Connectivity

WebCode: EPI2880

Light Black 96	EPA6790	$23	Matt Black 96	EPA6890	$23
Light Light Black 96	EPA6990	$22	Photo Black 96	EPA6191	$23



$87
Save $44
NEW

Samsung ML-1660 Mono Laser Printer

A compact laser printer with great convenience

16ppm Mono
1200 x 600 dpi
USB
Memory 8MB

WebCode: SAM0160

1.5K Black	SAM0162	$99



$394
Save $256
HOT PRICE

Samsung CLX-3175FN Colour Laser Multifunction

Fax / copier / printer / scanner

- 17ppm Mono & 4ppm Colour
- 2400x600 dpi Printing
- USB 2.0, Ethernet

WebCode: SAM3175

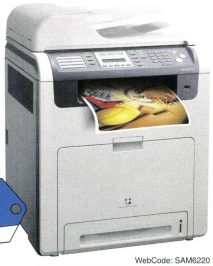
1.5K Black	SAM6564	$76
1K Cyan	SAM6565	$64
1K Magenta	SAM6566	$64
1K Yellow	SAM6567	$64

Samsung CLX-6220FX Colour Multifunction

Best value colour multifunction!

Reach out and explore the possibilities! The CLX-6220FX series is designed to fit the way your business works. There are a variety of advanced features, and simplified connectivity to match your needs.

- 20ppm Colour & Mono
- Duplex / Copy / Scan Print / Fax
- 65000 Page duty cycle
- USB 2.0, Ethernet
- 1 Year onsite warranty



$689
Save $310
NEW

WebCode: SAM6220

5K Black	SAM6271	$140	4K Magenta	SAM6273	$169
4K Cyan	SAM6272	$169	4K Yellow	SAM6274	$169



$312
Save $287

Samsung SCX-4828FN Mono Multifunction

Ideal for all your business needs

- Print, Scan, Copy, Fax
- 28ppm Mono
- Built-in Duplexer
- USB 2.0, Ethernet

WebCode: SAM4828

5K Black	SAM6572	$173



$399.80
Save $399

Samsung CLP-620ND Colour Laser

Efficient and sharp detail

- 20ppm Colour & Mono
- 9600x600 dpi Printing
- USB 2.0, Ethernet

WebCode: SAM0620

5K Black	SAM6271	$140
4K Cyan	SAM6272	$169
4K Magenta	SAM6273	$169
4K Yellow	SAM6274	$169



$242
Save $157

Brother MFC-7340 Mono 5-in-1 Multifunction

Print, Scan, Copy, Fax

- 20ppm Mono
- Up to 600 x 600 dpi
- USB Interface

WebCode: BRT0187

1.5K Black	BRT0206	$65
3K Black	BRT0285	$87



$978
Save $621

Brother MFC-9840CDW 6-in-1 Multifunction

Duplex Printing, Scan to email/iFAX

- 20ppm Mono, 20ppm Colour
- Up to 2400 x 600 dpi
- Wireless-G, USB, Ethernet

WebCode: BRT0168

1.5K Black	BRT2112	$97
1.5K Cyan	BRT2113	$114
1.5K Magenta	BRT2115	$114
1.5K Yellow	BRT2115	$114



$249
Save $150

Fuji Xerox Phaser 3100MFPX Mono Laser

Print / Copy / Scan / Fax

- Resolution 600 x 600 dpi
- 20ppm Mono
- USB 2.0

WebCode: FXP3109

4K Black	FXP3103	$148



$578
Save $221

Fuji Xerox DocuPrint C1190 Colour Multifunction

Print / Copy / Scan / Fax

- Resolution 600 x 600 dpi
- 12ppm Colour / 16ppm Mono
- USB 2.0, Ethernet

WebCode: FXP1190

3K Black	FXP1193	$106
3K Cyan	FXP1194	$175
3K Magenta	FXP1195	$175
3K Yellow	FXP1196	$175



$1776
Save $637

Fuji Xerox Phaser 8560DN Colour Laser

Efficient solid ink technology

- 30ppm Colour & Mono
- Built-in Duplexer
- USB 2.0, Ethernet

WebCode: FXP0562

3.4K Black	FXP0569	$71
3.4K Cyan	FXP0570	$126
3.4K Magenta	FXP0571	$126
3.4K Yellow	FXP0572	$126



$2099
Save $926

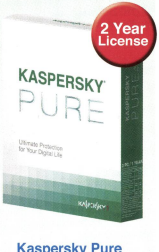
Fuji Xerox DocuPrint C3055DX A3 Colour Laser

Worlds smallest A3 colour laser

- 35ppm Mono & 8ppm Colour
- 600 x 600 dpi
- USB 2.0, Ethernet, Duplex

WebCode: FXP3055

6.5K Black	FXP3063	$72
6.5K Cyan	FXP3064	$308
6.5K Magenta	FXP3065	$308
6.5K Yellow	FXP3066	$308



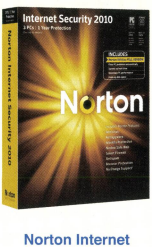
Kaspersky Pure

Total Protection for 2 years

Kaspersky PURE retains all the features that users of Kaspersky Anti-Virus and Kaspersky Internet Security have come to know and appreciate, including state-of-the-art technologies that allow suspect applications to be run in a secure virtual environment, proactive detection of unknown threats, application control and restrictions on the level of access that suspicious programs have to passwords, logins, personal information and operating system settings.

2 Year Subscription

3 Users	KAS0025	**$127**



Norton Internet Security 2010

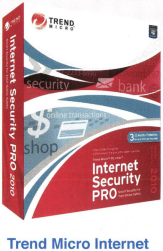
Safer. Smarter. Faster.

Every 6 seconds, an identity is stolen online. Don't leave yourself open to becoming the next victim. With billions of scans worldwide and over 350,000 virus attacks blocked every day, nothing compares to the power of Norton 2010.

- Minimal performance impact during gaming,video playback, presentations and more.

1 Year Subscription

3 Users	SYM8850	**$79**
5 Users	SYM8851	**$135**
10 Users	SYM8852	**$189**



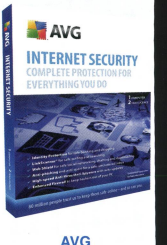
Trend Micro Internet Security Pro

Smart security for total online safety

With Trend Micro Internet Security, you no longer need to choose between computer performance and maximum protection. Get smart, proven security that never sleeps, guarding your PC from the latest threats while giving you the freedom to browse and shop online. Safeguard your PC and personal information without compromise.

1 Year Subscription

3 Users	TPK0200	**$99**
5 Users	TPK0280	**$159**
10 Users	TPK0290	**$287**



AVG Internet Security 9.0

Complete protection for everything you do

Anti-Virus, Anti-Spyware, Anti-Rootkit, Anti-Spam, Anti-Phishing, Enhanced Firewall, Web Shield, LinkScanner & Identity Protection.

- Safe banking and shopping
- Keeps your private information secure
- Ensures web pages you visit are safe.

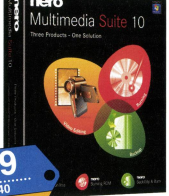
1 Year Subscription

1 User	AVG0006	**$49**
3 Users	AVG0009	**$71**
5 Users	AVG0007	**$98**
10 Users	AVG0008	**$182**

Nero Multimedia Suite 10

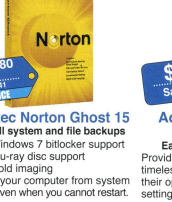
Excels your digital power with a collection of three products bundled into one powerful suite

Nero Multimedia Suite 10 excels your multimedia power with a collection of three products bundled into one powerful suite. It's loaded with advanced video editing features, media organizer and player, superior burning software, reliable backup technology, and special multimedia tools to enhance your music, photos and videos.



$129
Save $40
HOT SELLER

WebCode: NER0052



$58.80
Save $47
HOT PRICE

Symantec Norton Ghost 15

Create full system and file backups

- NEW! Windows 7 bitlocker support
- NEW! Blu-ray disc support
- NEW! Cold imaging
- Restore your computer from system failures even when you cannot restart.

WebCode: SYM8883



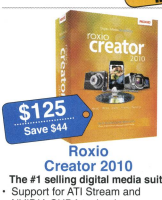
$58
Save $21

Acronis True Image Home 2010

Easy and fast disk imaging

Provides home users reliable and timeless backup and recovery of their operating system, applications, settings and personal files.

WebCode: MAN0171



$125
Save $44

Roxio Creator 2010

The #1 selling digital media suite

- Support for ATI Stream and NVIDIA CUDA technology.
- Burn and copy discs directly on your desktop.

WebCode: ROX5020



$154
Save $65

Roxio Toast 10 Titanium Pro for MAC

The leading MAC burning suite

The best way to get pro-quality results in burning, video and photo projects. Enjoy all the power of Toast 10.

WebCode: ROX5012



$86
Save $33

Parallels Desktop 5 for Mac

Includes Internet Security and Backup Software

Run Windows and Mac OSX side-by-side, drag-and-drop your files between operating systems.

WebCode: PAR0011



$78
Save $31

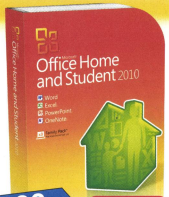
VMware Fusion 3 for Mac

The best way to run Windows on your MAC

Run the most demanding MAC and Windows applications side-by-side simultaneously at maximum speeds without rebooting.

WebCode: VMW0041

Microsoft Office 2010



$166
Save $43
FREE DELIVERY

PRICE CHECKER

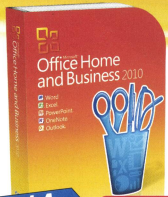
Officeworks	$174
Dick Smith	$178
Harvey Norman	$209

Microsoft Office 2010 Home & Student

Install on up to 3 computers at home!

- Microsoft Word 2010
- Microsoft Excel 2010
- Microsoft Powerpoint 2010
- Microsoft OneNote 2010

WebCode: MSA6162



$314
Save $65
FREE DELIVERY

PRICE CHECKER

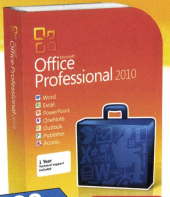
JB Hi-Fi	$326
Officeworks	$369
Dick Smith	$379
Harvey Norman	$379

Microsoft Office 2010 Home & Business

A must for any business

- Microsoft Word 2010
- Microsoft Excel 2010
- Microsoft Powerpoint 2010
- Microsoft OneNote 2010
- Microsoft Outlook 2010

WebCode: MSA6163



$683
Save $166
FREE DELIVERY

PRICE CHECKER

Officeworks	$838
Dick Smith	$849
Harvey Norman	$849

Microsoft Office 2010 Professional

The complete office package

- Microsoft Word 2010
- Microsoft Excel 2010
- Microsoft Powerpoint 2010
- Microsoft OneNote 2010
- Microsoft Outlook 2010
- Microsoft Access 2010
- Microsoft Publisher 2010

WebCode: MSA6164

Dragon NaturallySpeaking 10 Preferred

Voice recognition, speech-to-text software, perfect for dictation.

Small business and advanced PC users now have the power to create documents, reports and emails three times faster than most people type — with up to 99% accuracy. Surf the Web by voice or dictate and edit in Microsoft Word and Excel, Corel WordPerfect, and most other Windows based applications.





BONUS
Logitech Webcam C250

$219
Save $180
LIMITED STOCK

WebCode: NUA0159



Windows 7

Everything you need for business and home

Home Premium	MSA5131	$265	SAVE $34
Home Premium - Upgrade	MSA5132	$165	SAVE $30
Professional	MSA5134	$379	SAVE $70
Professional - Upgrade	MSA5135	$339	SAVE $60
Ultimate	MSA5128	$389	SAVE $30
Ultimate - Upgrade	MSA5129	$339	SAVE $90



BONUS
Logitech LS1 Laser Mouse

$114
Save $35
HOT PRICE



PDF Converter Professional 6

Complete PDF solution designed specifically for the business user

You'll be able to access valuable information trapped in a digital or scanned document

WebCode: NUA0156



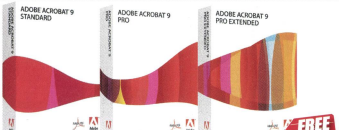
$48
Save $42
HOT PRICE

Nuance PDF Create 6

Create secure PDF files from any PC application

Create documents up to 3 times faster than with other PDF applications with results that are universally viewable from virtually any PDF viewer.

WebCode: NUA0128



Adobe Acrobat 9 Series for Windows

Modify and create visually stunning PDF's

Acrobat Standard	ALD9649	$399	SAVE $174
Acrobat Pro	ALD9652	$594	SAVE $264
Acrobat Pro Student & Teacher	ADS5023	$138	SAVE $27
Acrobat Pro Extended	ALD9650	$939	SAVE $389



Lapazz Graphic Tablets

Freestyle draw like never before!

Lapazz Tablets will give you more flexibility in exploring your creativity and mastering your design skills. With Wired & Wireless versions available, 1024 levels of pressure, and compatible with Windows 7. Lapazz allows you to be the master of all creations!

5 x 4" - Wired	LPZ0001	$44
5 x 3" - Wireless	LPZ0003	$58
8 x 5" - Wired Hotkey	BUN0093	$66
10 x 6" - Wired Hotkey	BUN0094	$88

MindManager 8

The leader in visual mapping

MindManager is the ultimate tool for increasing productivity – for you or your entire team. Use it to visually connect ideas and information to help you save time, solve real business problems, improve business processes and drive innovation. By visually organising all your information, you'll have the big picture clearly before you, while still tracking the smallest details.

Academic
MIN5035 $174

$372
Save $90
FREE DELIVERY



WebCode: MIN5041

Adobe Photoshop Elements 8 & Adobe Premiere Elements 8

Photo and video editing made easy!

Adobe Elements software makes it easy to create incredible movies & photos. Get started quickly with automated moviemaking options, add knockout visuals and sound, and share your creations everywhere.



$197
Save $72
HOT PRICE

WebCode: ADS5003



$104
NEW

Sony Sound Forge Audio Studio 10

Audio recording, editing & mastering made easy

- Record, edit, and convert audio from almost any source.
- Record, restore, and archive music your collections of vinyl or cassettes.

WebCode: SNY70707



$126
Save $23
HOT PRICE

Sibelius 6 First

Play. Compose. Share.

- Easily create original songs
- Arrange for different instruments
- Realistic playback
- Publish, Export and Share

WebCode: SIB0005



$99
Save $35
HOT PRICE

Corel Paintshop Photo Pro X3

The best photo-editing software for DSLR cameras

- Enhanced! Photo Organiser
- New! Easy Batch Processing
- Enhanced! Express Lab

WebCode: COR9222



$132
Save $57
HOT PRICE

Corel Photo & Video Pro Bundle

Get two great products at one great price!

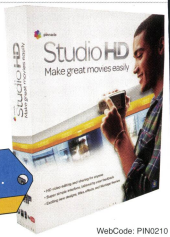
- Load, organise and edit photos and standard or HD videos
- Get quick results with express editing or go deep with advanced tools

WebCode: COR9228

Pinnacle Studio 14 HD

Make great movies at home

Capture, edit and tell your story. Pinnacle Studio HD is powerful, yet a cinch to use. Easily add emotion with music, heighten suspense, hilarity or surprise by editing scenes and create impact with Montage Themes, transitions, animations and effects.



$79
Save $20
HOT PRICE

WebCode: PIN0210



$89
HOT PRICE

WebCreator 5 Pro

The easy solution for creating professional websites

Spectacular VISTA-style graphic effects are just one click away

- Over 150 customisable templates!
- No programming required!
- Add visual effects, media content, photos, forums & blogs.

WebCode: WBC0001



$218
Save $22
FREE DELIVERY
SmartDraw

SmartDraw 2010

Create stunning artwork in Microsoft Office with ease

Quickly create the business graphics you need to succeed. SmartDraw is the perfect companion product to Microsoft Office.

WebCode: SMT2010



$138
Save $30
HOT PRICE

Corel VideoStudio Pro X3

High-speed HD video editing and production

Make quick edits, or combine video clips, photos, music and voiceover to create a professional-looking video project in minutes

WebCode: COR9229



$135
NEW

Sony Vegas Movie Studio HD Platinum 10

Professional video editing & DVD authoring

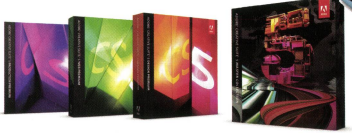
- Edit and produce movies with special effects and transitions
- Create DVDs and Blu-ray Disc media with custom menus & graphics
- Share movies on PSP, iPod, iPhone, online, and more

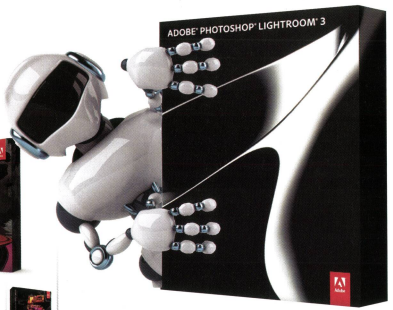
WebCode: SNY70705

Adobe

Creative Suite 5

Design without boundaries





Adobe

Components	Design Standard	Design Premium	Web Premium	Production Premium	Master Collection
	For print-centric designers & print professionals	For designers in print and online	For web developers interactive designers & RIA developers	For video editors motion graphics & visual effects artists	For cutting-edge creative pros & education
Photoshop Extended		●	●	●	●
Photoshop	●				
Illustrator	●	●	●	●	●
InDesign	●	●			●
Acrobat 9 Pro	●	●	●		●
Flash Catalyst		●	●	●	●
Flash Professional		●	●	●	●
Flash Builder			●		●
Dreamweaver		●	●		●
Fireworks		●	●		●
Contribute			●		●
Premiere Pro				●	●
After Effects				●	●
Soundbooth				●	●
OnLocation				●	●
Encore				●	●
Pricing					
Student & Teacher	**$260**	**$316**	**$314**	**$316**	**$473**
WebCode - WIN	ADS5025	ADS0060	ADS0062	ADS5007	ADS5005
WebCode - MAC	ADS5024	ADS5000	ADS0061	ADS5006	ADS5004
Academic	**$580**	**$771**	**$771**	**$771**	**$1,282**
WebCode - WIN	ADE5008	ADE5006	ADE5010	ADE5014	ADE5012
WebCode - MAC	ADE5007	ADE5005	ADE5009	ADE5013	ADE5011
Upgrade	**$688**	**$825**	**$825**	**$822**	**$1,236**
WebCode - WIN	ADU5011	ADU5007	ADU5015	ADU5023	ADU5019
WebCode - MAC	ADU5009	ADU5005	ADU5013	ADU5021	ADU5017
Full	**$1,781**	**$2,601**	**$2,464**	**$2,328**	**$3,557**
WebCode - WIN	ADC5008	ADC5006	ADC5010	ADC5014	ADC5012
WebCode - MAC	ADC5007	ADC5005	ADC5009	ADC5013	ADC5011

Adobe Photoshop Lightroom 3

Simplify photography from shoot to finish

Bring out the best in your photography with Adobe Photoshop Lightroom 3 software, an intuitive digital darkroom and efficient assistant. Create incredible images, showcase your photography with style and impact, and easily manage your growing photo collection all from within one fast application.

Lightroom 3	ADC5044	$397
Lightroom 3 - Student	ADS5026	$88
Lightroom 3 - Academic	ADE5039	$128
Lightroom 3 - Upgrade	ADU5079	$144



Adobe Photoshop CS5 Extended

Discover new dimensions in digital imaging

Go beyond traditional image editing by bringing 3D elements to your 2D artwork directly within your favorite digital imaging application.

WebCode - WIN: ADL5032
WebCode - MAC: ADL5031



Adobe Dreamweaver CS5

Design, develop, and maintain standards-based websites and applications

Empowers designers and developers to build standards based websites with confidence.

WebCode - WIN: ADC5020
WebCode - MAC: ADC5019



Adobe Illustrator CS5

Explore new paths with the essential vector tool

Create distinctive designs for any project. Used by creative professionals worldwide, Adobe Illustrator CS5 software provides precision and power.

WebCode - WIN: ADL5026
WebCode - MAC: ADL5025



Adobe Premiere Pro CS5

Design professional layouts for print and digital publishing

Precise control over typography and built-in creative tools for designing, preflighting and publishing.

WebCode - WIN: ADC5028
WebCode - MAC: ADC5027

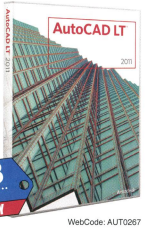
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AutoCAD LT 2011

The most comprehensive 2D CAD solution

Get more options for precise control of your 2D drawings with AutoCAD LT 2011 software, a leader in 2D drafting productivity and data reliability. New tools provide flexibility and control and help you manage the appearance of drawings. The professional choice in 2D drafting software now offers more ways to control your drawing productivity.

Upgrade from 2008/09/10 (AUT0269) **$990**



$1718
Save $332
FREE DELIVERY

WebCode: AUT0267

AutoCAD 2011

Take design further

Design and shape the world around you with the powerful, flexible features found in AutoCAD software, one of the world's leading 2D and 3D design applications. Help speed documentation, share ideas seamlessly, and explore concepts more intuitively in 3D.

Upgrade (AUT0285) **$3272**

Upgrade from LT (AUT0288) **$5500**



$5776
Save $741
FREE DELIVERY

WebCode: AUT028

Autodesk 3ds Max Design 2011

3D modelling, and animation solution software

Autodesk 3ds Max Design 2011 software offers compelling new techniques for bringing designs to life by aggregating data, iterating ideas, and presenting the results. Streamlined, intelligent data exchange workflows and innovative new modeling and visualization tools help significantly increase designers' creativity and productivity, enabling them to better explore, validate, and communicate the stories behind their designs.



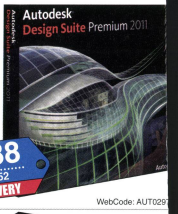
$5796
Save $941
FREE DELIVERY

WebCode: AUT0290

Autodesk Design Suite Premium

AutoCAD Power. Enhanced Design and Visual Communication.

For designers who need it all, the Autodesk Design Suite 2011 combines the power and flexibility of AutoCAD software with enhanced sketching, illustration, and concept design workflows, as well as Autodesk's leading visualization solutions. Design Suite Premium includes AutoCAD, Autodesk Alias Sketch, Autodesk Showcase, Autodesk 3DS Max Design.



$7988
Save $152
FREE DELIVERY

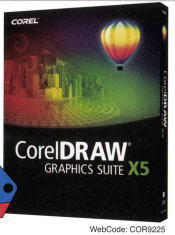
WebCode: AUT029

CorelDRAW Graphics Suite X5

Professional graphic design software for any media

- Illustration, layout, tracing, photo editing and web graphics, all in one!
- Built-in learning tools, video tutorials, expert tips, online guidebook

Upgrade (COR9226) **$249**



$479
Save $350
FREE DELIVERY

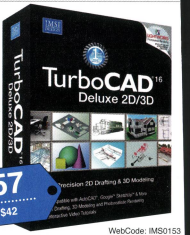
WebCode: COR9225

TurboCAD 16 Deluxe 2D/3D

Unlimited design options

Hundreds of professional drafting and design tools, incredible file support, video and interactive tutorials. Recreate products, architecture, and floor plans with ease.

- 2D Drafting/Drawing
- 3D Modelling
- CAD Projects



$157
Save $42

WebCode: IMS0153

Wacom Cintiq 21UX 2nd Generation Graphic Tablet

High-resolution display and a dynamically adjustable stand

- 1600 x 1200 Resolution
- Incline display from 10° to 65°
- MAC & Windows compatible



$2648
Save $199
NEW

WebCode: WAC0120



wacom

FREE DELIVERY

Wacom Intuos4 Graphic Tablets

Precise control for graphic professionals

Intuos4 – Small	4 x 6"	WAC4400	$283
Intuos4 – Medium	6 x 9"	WAC6400	$421
Intuos4 – Medium Wireless	6 x 9"	WAC6401	$465
Intuos4 – Large	8 x 13"	WAC8400	$569
Intuos4 – XLarge	12 x 19"	WAC1240	$866

Microsoft® Visual Studio® 2010



Microsoft Visual Studio 2010

Each edition of Microsoft Visual Studio 2010 was built with the specific needs of individual developers and development teams in mind. Learn which edition is right for you.

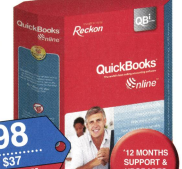
Professional Full	MSS10085	$1,187	SAVE $200
Professional Upgrade	MSS10087	$807	SAVE $138
Premium MSDN	MSS10078	$8,176	SAVE $1354
Premium Renewal MSDN	MSS10079	$3,438	SAVE $573
Ultimate	MSS10094	$17,857	SAVE $2918
Ultimate Renewal MSDN	MSS10095	$5,713	SAVE $936

QuickBooks Online

Work anywhere, any time

Incorporates core functionality with the ability to access your company file anywhere anytime over the internet.

- Integrated payroll management
- Track and manage inventory
- Advanced security
- Multi user capable
- Time billing and job costing
- Invoice, pay bills and track expenses



WebCode: QUI0214
*Offers end 31st July 2010

QuickBooks Accounting 2010/11 + Advantage

Inventory tracking and management

Specifically designed for business that need to track and manage their finances and inventory.

- Process credit card payments
- Import bank statements
- Track GST and lodge BAS online
- Produce business reports
- Track and manage inventory



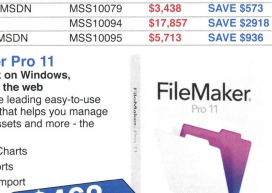
WebCode: QUI0199
*Offers end 31st July 2010

FileMaker Pro 11

Tackle any task on Windows, MAC, and the web

FileMaker Pro is the leading easy-to-use database software that helps you manage people, projects, assets and more - the easy way.

- New! FileMaker Charts
- New! Quick Reports
- New! Recurring Import



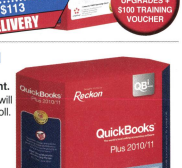
WebCode WIN/MAC: FIL2514

QuickBooks Plus 2010/11 + Advantage

Comprehensive Payroll Management.

QuickBooks Plus' powerful functionality will help you manage inventory & track payroll.

- Integrated payroll management
- Track and manage inventory
- Process credit card payments
- Import bank statements
- Produce business reports
- Track GST & lodge BAS online
- Organise employee information



WebCode: QUI0200
*Offers end 31st July 2010



Bento 3 for MAC

See, secure and share information like never before!

Organize contacts, track projects, plan events and more - all in one place and more efficiently with Bento 3.

WebCode: FIL2018



FileMaker Server 11

Server software for database management

Fast, reliable, easy-to-manage server software for groups of FileMaker Pro users.

WebCode WIN/MAC: FIL2515



QuickBooks Contractor 2010/11

Specifically designed for contractors

- Multicurrency
- Integrated payroll management
- Measure time billing and job costing
- Track and manage inventory

WebCode: QUI0217 *Offers end 31st July 2010



QuickBooks Premier 2010/11 + Advantage

3 license multi user

- Multicurrency
- Integrated payroll management
- Measure time billing and job costing
- Track and manage inventory

WebCode: QUI0202

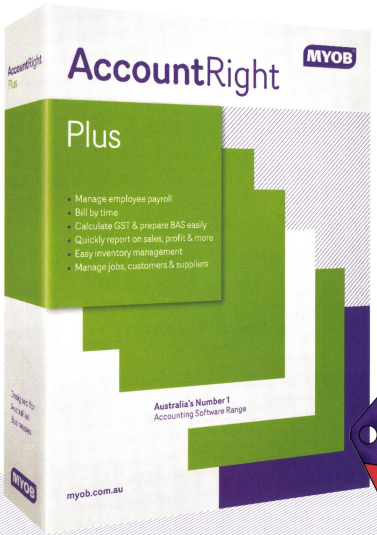
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MYOB AccountRight Plus 19

Great for expanding businesses



Start recording transactions without knowledge of accounting concepts and principles. Quickly learn how to process transactions or tasks with the in-built step-by-step guide. Easily process weekly, fortnightly or monthly pay runs and email pay slips to staff. Import time sheets to produce a pay run and preview employee pays before processing. Quickly generate reports on PAYG withholdings, superannuation, leave deductions, allowances and bonuses.

- See how your business is performing
- Bill for your time
- Enhanced help centre
- Sales invoices & manage debtors
- Pay & track expenses
- Manage creditors
- Company Data Auditor

$577
Save $172
FREE DELIVERY

WebCode: MYB0108



MYOB BusinessBasics

Manage all your basic business tasks from the one easy program

Designed specifically for small or home-based Australian businesses. Streamline the data entry and reconciliation side of managing your business and free up your time to focus on running it.

WebCode: MYB0004



MYOB AccountRight Standard 19

Ideal for small businesses

The smarter way to manage your business and inventory requirements.

- Calculate your GST & BAS
- Google maps Integration

WebCode: MYB0107



MYOB AccountRight Premier 19

Powerful multi-user software

Process foreign currency transactions, streamline payroll and analyse your business in greater detail.

WebCode: MYB0110



MYOB RetailManager

An advanced retail management and point of sale system

RetailManager gives you a clear snapshot of how your business is performing at anytime. It's simply the smarter way to run your retail business.

WebCode: MYB0099

Portable Edition

Pioneer of Innovative Technology

DreamBook ePad 7/10

7" Screen $199 RRP

10" Screen $299 RRP

- App Store
- Internet
- Music
- Video



- Android
- Email
- eBook
- VIA CPU

Launched in Computex 2010

DreamBook ePad A11

10.1" Multi-touch Screen

$599 RRP



- eBook
- Music
- Calendar
- YouTube/Video
- Photos
- Colour
- Word/Excel/Ppt
- Internet
- Email

DreamBook ePad L11

11.6" HD Multi-touch Screen

$699 RRP



- Skype
- Multi-touch
- 3G Option
- Intel Atom CPU
- Ready for Windows 7

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Epson Stylus® Photo TX710W

Including
- Up to 40ppm printing
- 2.5" colour LCD viewer
- Up to 4800 dpi scanning
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- PictBridge
- Dual paper trays

Your imagination becomes reality with the Epson Stylus® Photo range

Make sure your images are captured as you imagine them by using Epson Stylus® Photo printers – 86% of professional photographers do*. All you need is in the range – 4800dpi scanner, Claria® high-definition photographic ink, UltraChrome ink, individual ink cartridges, Epson PhotoEnhance, memory card slots, 7.8" touch sensor operation panel, 3.5" LCD viewer, 4" x 6" photos from 10 seconds and Italian design.



Epson Stylus® Photo TX810FW



Epson Stylus® Photo TX650



Epson Stylus® Photo T50

A3+



Epson Stylus® Photo 1410

A3+



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*Taverner Research (Aust) August 2007

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